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ANNUAL REPORT
OF THE
SURGEON GENERAL OF THE
PUBLIC HEALTH SERVICE
OF THE UNITED STATES

FOR THE FISCAL YEAR
1921



WASHINGTON
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TREASURY DEPARTMENT,

Document No. 2903,

Public Health Service.

LETTER OF TRANSMITTAL.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, December 5, 1921.

SIR: In accordance with section 9 of the act of Congress approved July 1, 1902, I have the honor to transmit herewith the report of the Surgeon General of the Public Health Service for the fiscal year 1921.

Respectfully,

A. W. MELLON,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

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ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE.

TREASURY DEPARTMENT,
BUREAU OF THE PUBLIC HEALTH SERVICE,
Washington, D. C., October 12, 1921.

SIR: In accordance with the act of July 1, 1902, I have the honor to submit for transmission to Congress the following report of the operations of the Public Health Service for the fiscal year ended June 30, 1921. This is the fiftieth annual report of the service, covering the one hundred and twenty-third year of its existence.

The administrative organization of the bureau on June 30, 1921, was as follows:

- (1) Scientific Research.
- (2) Domestic (Interstate) Quarantine.
- (3) Foreign and Insular (Maritime) Quarantine and Immigration.
- (4) Sanitary Reports and Statistics.
- (5) Marine Hospitals and Relief.
- (6) Personnel and Accounts.
- (7) Venereal Diseases.
- (8) Inspection Service.
- (9) Section of Public Health Education.
- (10) Purveying Service.
- (11) Chief Clerk.

The administrative heads of the service and the chiefs of the bureau divisions at the close of the fiscal year consisted of the following:

Surg. Gen. Hugh S. Cumming.

Asst. Surg. Gen. C. C. Pierce, in charge of Division of Venereal Diseases.

Asst. Surg. Gen. C. H. Lavinder, in charge of Division of Marine Hospitals and Relief.

Asst. Surg. Gen. J. W. Kerr, in charge of Division of Personnel and Accounts.

Asst. Surg. Gen. J. W. Schereschewsky, in charge of Division of Scientific Research.

Asst. Surg. Gen. A. J. McLaughlin, in charge of Division of Domestic Quarantine.

Asst. Surg. Gen. R. H. Creel, in charge of Division of Foreign and Insular Quarantine and Immigration.

Asst. Surg. Gen. B. S. Warren, in charge of Division of Sanitary Reports and Statistics.

Asst. Surg. Gen. J. H. White, in charge of Inspection Service.

Surg. Carroll Fox, in charge of Purveying Service.

Surg. (R.) Charles Bolduan, in charge of Section of Public Health Education.

Chief Clerk, Daniel Masterson.

Secretary to Surgeon General, F. Gwynn Gardiner.

OUTSTANDING ACTIVITIES OF PUBLIC HEALTH SERVICE DURING THE
YEAR.

As organized, the Public Health Service constitutes by far the largest Federal agency for the protection of the public health, and the most important Federal functions are (1) the prevention of the introduction of diseases into the United States, or from one State to another State; (2) the investigation of diseases of man and stream pollution; (3) supervision and control of biologic products; (4) public-health education; and (5) the operation of a hospital service for its beneficiaries, including disabled ex-service men and women.

NATIONAL AND INTERSTATE QUARANTINE.

During the present year the Public Health Service took over the quarantine station for the city of New York. The service now operates all of the maritime quarantine stations in the United States. Owing to the present health conditions in foreign countries as to cholera and plague, it has now stationed 35 officers for duty in Europe to enforce certain quarantine restrictions in regard to ships and passengers bound for ports of the United States.

For the control of such diseases as cholera, yellow fever, plague, typhus fever, and the like, the Congress has appropriated the "Epidemic fund" which is used by the Public Health Service for the prevention of the introduction of these diseases into the United States, or from one State to another State. In the last annual report of that service it was noted that plague was present in Pensacola, Fla., Beaumont, Galveston, and Port Arthur, Tex., New Orleans, La., and San Francisco, Calif. Measures for its control have continued with such success that the operations of the service in this connection have been reduced to the minimum which is required to prevent further menace from its spread in the United States.

It affords me great satisfaction to be able to report that there has been no epidemic of serious proportions in the United States during the present year. It may be expected, however, owing to the present financial depression which exists throughout the United States, that those diseases which have a distinct relation to economic conditions will show an increase in prevalence during the coming year unless the financial conditions show an early and material improvement.

SCIENTIFIC RESEARCH.

In the matter of investigations of diseases of man and the pollution of streams, the Public Health Service has continued, through its Division of Scientific Research, such investigations and demonstrations as could be carried on within the limits of its appropriations. Of special importance has been its demonstrations in rural sanitation. With a sum of about \$30,000 appropriated for cooperation with States, it has carried on in cooperation with State and local health boards health demonstrations in which the State and local authorities have contributed over \$8 to \$1 of Federal funds. The Scientific Research Division of the service has continued its work in investigations of child hygiene, industrial sanitation, in-

fluenza, pneumonia, pellagra, trachoma, tuberculosis, biologic products for the prevention and cure of diseases of man, pollution of streams, etc.

HOSPITAL SERVICE.

As stated in the last annual report, the signing of the armistice, with the resulting rapid demobilization of the military forces, threw an extraordinary burden upon the hospital facilities of the United States to provide medical care and treatment for disabled ex-service men and women. The Public Health Service was utilized for this purpose and its hospital facilities were expanded rapidly in order to meet the emergency. It has now in operation hospitals with the capacity of 18,818 (as of June 25, 1921) beds and will shortly open other hospitals with an additional capacity of about 5,000 beds.

In the inception of this work the Public Health Service divided the United States into 14 districts and established offices for the examination and assignment to hospitals of beneficiaries of the War Risk Insurance Bureau. These functions were performed by the service as an agency of the War Risk Insurance Bureau. In order, however, to centralize the services furnished to disabled ex-service men and women, the Secretary of the Treasury by the order of April 19, 1921, transferred all of activities of the Public Health Service which related to the beneficiaries of the War Risk Insurance Bureau to that bureau, except those activities which related to the operation of the hospitals and dispensaries. This order was legalized by the Sweet bill, which was approved August 9, 1921. This order relieved the Public Health Service of many duties which clearly belong to that bureau and which had been operated by the Public Health Service for the War Risk Insurance Bureau owing to the fact that the organic laws of the Public Health Service permitted decentralization of its activities, whereas such decentralization was not authorized by law for the Bureau of War Risk Insurance. Under the Sweet Act it is somewhat uncertain at the present time as to exactly what part the Public Health Service may play in the program of hospitalization of beneficiaries of the Veterans' Bureau, but it seems likely that it will continue to furnish a large measure of the hospital facilities for the medical care and treatment of the beneficiaries of that bureau. In order that the hospitalization plans of the Public Health Service may be successful, it is believed that every effort should be made to establish upon a definite basis a clearly outlined program with a definite determination of the responsibility of the service in this regard. It should be understood by the Veterans' Bureau that the Public Health Service stands ready at all times to provide hospitals and dispensaries for its beneficiaries to the limit of its capacity.

It should, however, be borne in mind that in the attempt to supply under emergency conditions sufficient hospital facilities to meet the needs of that bureau the service has been obliged to acquire control of many unsatisfactory hospitals, and such hospitals are to-day being operated for the care of ex-service men and women. Since there now exists some money for the construction of more satisfactory facilities, every effort should be made during the coming year to abandon as rapidly as possible unsatisfactory hospitals, to improve existing plants, and, as far as possible, to consolidate hospitals now operated

by the service. Since the Public Health Service is charged with the permanent responsibility of the care of beneficiaries other than those of the Veterans' Bureau and for many years has operated a chain of hospitals for this purpose, it is believed that (insofar as the interests of the disabled ex-service men and women are concerned) every effort should be made in the improvement and extension of its hospital facilities so to manage affairs that ultimately there will remain a satisfactory system of hospitals in the Public Health Service for the treatment of beneficiaries other than the patients of the Veterans' Bureau.

Concerning the work of the Public Health Service for the veterans of the World War, I wish to state that that service has met this emergency in as efficient manner as it was humanly possible under the circumstances to do. Since the beginning of this work the service has examined over 1,000,000 applicants for compensation, furnished hospital care to 200,000 patients, dispensary treatment to about 1,300,000 patients, dental service to 75,000 patients, and occupational and physiotherapy to 10,000 patients each week. In order to furnish this treatment it has assembled a personnel consisting of 1,207 commissioned medical officers, about 1,100 medical and other consultants, 1,637 nurses, 145 dietitians, 498 reconstruction aides, and about 12,400 other personnel.

SCIENTIFIC RESEARCH DIVISION.

The interest of the general public in public-health measures, the value of which was so thoroughly demonstrated during the war, has remained active during the current fiscal year. There has been considerable evidence of a growing consciousness on the part of the public of their personal and civic responsibilities for the improvement of local health conditions. This has resulted in a well-marked demand for the results of investigation into the causes and prevention of disease. Large demands have been made on the division for researches on various public-health matters, which have reached the bureau through State health officers or other public officials. The need is urgent to extend research work of the Federal Government into the causes and prevention of diseases of man. There is special urgency for the further study and investigation of such diseases as respiratory infections, including tuberculosis and influenza, which during 1919 were responsible for 27.42 per cent of the mortality in the registration area; of the causes of neonatal mortality, which brings about over 40 per cent of the 250,000 deaths occurring annually in children and infants under one year of age in the United States; and last but not least the diseases affecting the population of the middle-age group. These diseases have become more significant in recent years, because improved methods of controlling the communicable diseases which take their chief toll of the younger population groups, and advances in sanitation, have definitely increased the number of survivors after the age of 45. The diseases referred to consist of the so-called degenerative diseases, such as organic disease of the heart and other lesions of the cardio-vascular system, cancer, and kidney disease. There is cumulative evidence which points to the fact that at least a factor in the production of some of these diseases are infections acquired during the earlier part of life. If the incidence of these diseases is to be reduced, there is need of intensive investigations into the matter and a general clarification of our knowledge of the part played by focal infections to the incidence of these diseases. Systematic studies along these lines are urgently needed, but to undertake them additional funds must be made available.

With existing appropriations during the current fiscal year it has been practicable to make researches only with reference to the following diseases: Amoebiasis, anthrax, botulism, deer-fly fever, hookworm, epidemic cerebrospinal meningitis, influenza and pneumonia, smallpox, leprosy, malaria, pellagra, plague, poliomyelitis, syphilis and related diseases, trachoma, tuberculosis, typhoid and yellow fever.

In the case of leprosy the studies of the service during the past year have progressed along the line of treatment with chaulmoogra oil derivatives. Experiments in the use of the ethyl esters of chaulmoogra oil by intramuscular injection have given satisfactory results in some cases where the disease was not chronic or where it occurred in a mild form. The effect of this treatment has been so encouraging

that now many persons in Hawaii afflicted with leprosy voluntarily present themselves for treatment, whereas in the past they would have endeavored to hide from the authorities in order to escape segregation. In many cases after the chaulmoogra oil treatment the lesions disappear, except for scars and permanent injuries, and the leprosy bacillus can no longer be demonstrated. Whether or not the apparent cures are real and permanent, it is probable that there has been developed a valuable agent for the treatment of leprosy.

Former researches have led to the belief that pellagra is caused by a deficiency in the diet of some unidentified food substance. Notable progress has been made during the past year in the researches to identify this constituent, it having been ascertained that the anti-neuritic and fat-soluble vitamins and the mineral salts do not constitute this essential food element. The investigation seems to be narrowed down to a consideration of the amino-acid group in its relation to the causation of pellagra.

The investigations by the service of malaria, a specific disease resulting from infection through the bite of the *Anopheles* mosquito, have led to demonstration studies of malaria-control measures, including the administration of quinine on a large scale for the elimination of carriers, the drainage of waste land, oiling of ponds and ditches, the use of fish, the use of larvicides, burning of weeds, and other means of destroying mosquitoes and eradicating their breeding places. Valuable cooperation in these demonstration studies has been given by State and local health authorities, the International Health Board, and by railroads in malarious districts. The service continued its work of making surveys of impounded-water projects with a view to reducing the danger of malaria infection from these sources. Six such surveys were completed during the past year. Investigations were continued in an effort to solve some of the most important problems that have presented themselves in the study of the life habits of the *Anopheline* mosquito. Some of these studies are connected with the relation of domestic animals to the transmission of malaria, the distribution of *Anopheline* mosquitoes, seasonal transmission of malaria, and larvicide experiments. Laboratory studies were conducted to find out the longevity of these mosquitoes, the viability of malaria parasites in mosquitoes, and the blood picture of malaria.

During the past year the division has continued the studies and investigations in matters relating to child hygiene, industrial hygiene, public-health administration and organization, sewage disposal, pollution of streams, excreta disposal, rural sanitation, and supervision of the manufacture and sale in interstate traffic of viruses, serums, toxins, and analogous products, including arsphenamine and nearsphenamine.

The studies of rural sanitation conducted by the service in cooperation with State and local health authorities touch upon every important phase of health work, such as safeguarding of water and food supplies, sanitary excreta disposal, fly control, antimalaria measures, infant and child hygiene, school inspection, antituberculosis and antivenereal disease measures, industrial hygiene and investigations and control of excreta-borne diseases. During the past year the service has conducted cooperative rural health work in 38

counties or districts in 15 States. Although the appropriation for this work was only \$50,000, its expenditure under this plan by the service has resulted in the mobilization of some \$200,000 of local funds, and considerably larger appropriations have been indirectly made available by private individuals and corporations.

The studies of child hygiene have included research along special technical lines, general surveys of conditions affecting child life, and child welfare administration. The investigation of the food value of dried milk as an infant food has shown that good brands of whole dried milk are apparently the equivalent in nutritive value of high-grade pasteurized milk. Considerable attention has been paid by the service to the relation of oral hygiene to child health. Studies of the incidence of mental defect among the population have been made and the results analyzed with a view to working out practical suggestions for diminishing the incidence of preventable mental deficiency.

In the studies of industrial hygiene made during the year surveys have been completed of the foundry industry, the pottery industry, and intensive studies made of the incidence of occupational dermatoses caused by oily fluids, such as "cutting compounds." A survey was begun of health hazards in the glass industry, which affords an opportunity for an investigation of the effects of heat and light on workers. Methods have been recommended for the avoidance of occupational lead poisoning in the pottery industry by the use of sanitary precautions and by the use of fritted glazes and leadless glazes. The principles of the composition of these glazes have been indicated. In addition to this assistance has been given to a large number of manufacturers to aid them in solving their individual health problems in industry. Progress has been made in the investigations of industrial fatigue with reference to spoiled work, individual variation in output, and the effect of overtime in reducing the rate of output.

The division has continued its work of supervision of the biologic products as required by the law of July 1, 1902, regulating the sale of viruses, serums, toxins, and analogous products in interstate traffic. The value of the biologic products amounts to about \$10,000,000 annually. Special investigations in this field have been directed toward the cause of sudden death from the administration of arsphenamine and in the standardization of pneumococcus serum. Under the work of the service the quality and therapeutic efficiency of arsphenamine, neoarsphenamine, and the like have steadily improved, so that these agents now pass a standard twice as rigid as when their manufacture was first undertaken in the United States.

The Scientific Research Division has cooperated with other Government bureaus and with private associations and health councils in investigations of various kinds along the line of the causation and control of disease, and has arranged for the representation of the service at meetings of scientific and sanitary associations and congresses and for popular lectures by service officers before public meetings varying widely in character.

The preceding summary merely touches upon a few of the significant features of the division's work during the past year. A detailed account of this work follows:

BOTULISM.

In December, 1919, a systematic investigation of botulism, of which there had recently been a number of outbreaks, was proposed by the National Cannery Association, the Cannery League of California, and the California Olive Association. Epidemiologist J. C. Geiger was detailed to cooperate on behalf of the service in these investigations, which were jointly carried on with the statistical department of Stanford University, the University of California, and the California State Board of Health. The intent of the original plans was to confine the study of botulism to the State of California, but these plans were later broadened so as to include the consideration of outbreaks of this disease throughout the United States. In the light of recently acquired information, it is evident that botulism is not uncommon in the United States. In California and Washington about 15.4 per cent and 10.8 per cent, respectively, of the total mortality due to food poisoning can be attributed to botulism. In other States this percentage is less; for example, in New York about 4 per cent of all deaths due to food poisoning are caused by this intoxication. Botulism in the United States is therefore by no means infrequent, but as a cause of death it is not so important as might be inferred from the attention paid to it in the daily press. Although the number of actual cases of botulism is thus far comparatively small, it should, however, be emphasized that in recent years a striking increase of this disease has taken place in various localities. It is unfortunate that food poisoning, food infections, and botulism are reportable diseases only in the States of California, Oregon, and New York.

The investigations of the service were directed along the lines of determining the factors responsible for the occurrence of the disease and especially, if possible, the forces operative for its rather disquieting increase. A primary requirement of any discussion of the subject is a definition of botulism from a clinical, pathological, bacteriological, and toxicological viewpoint. This has not as yet been made. It can readily be seen, therefore, that detailed epidemiological studies are a necessary preliminary to this investigation.

During the month of April, 1921, an intensive survey on botulism was conducted in the Yakima Valley, Wash., by the service representative. In a general way the botulism observations made in this instance differ in no respect from those previously found for the entire State of Washington, or for California. The case mortality rate for the 11 outbreaks in Washington was 66.6 per cent, namely, 16 deaths among 24 cases. Again, botulism was observed only during the fall, winter, and spring months—from October till May; one-third of all the cases occurred during the month of November. A reasonable explanation of this seasonal incidence is the customary habit of consuming preserved vegetables and fruits during the seasons in which the fresh products are not available.

The foodstuffs which were responsible for the botulism cases in Washington State are shown in the following chart:

Food.	Canning processes.			Spoilage.	Cases.	Amount consumed.	Laboratory proof.	Animals affected.
	Home.	Commercial.	Method.					
Corn.....	+	Cold pack.....	+	1	2 teaspoonfuls.....	.....	Chickens.
Do.....	+	do.....	+	1	Tasted.....	.....	Do.
Do.....	+	do.....	+	1	do.....	.....	Do.
Do.....	+	do.....	+	1	Teaspoonful.....	+ type A..	
Spinach.....	+	do.....	±	3	.....	.....
Do.....	+	Pressure cooker.....	No....	2	.....	.....	Do.
Asparagus.....	+	Cold pack.....	+	3	.....	+ type A..	Do.
Do.....	+	do.....	+	6	.....	.....	Do.
String beans.....	+	do.....	++	1	3 to 6 small bean pods.....	+ type A..	
Milk.....	+	Pressure.....	+	4	.....	.....

The facts are nearly identical with those already observed in the cases in California, with the exception that instead of string beans corn was the leading cause. This vegetable is excellently suited for the development of a strong botulinus toxin and offers extreme difficulties in sterilization on account of the slow heat penetration in heavily filled jars. Furthermore, it is not unlikely that the repeated handling which is necessary to prepare this vegetable for canning assists in the contamination of the product with the spores of *B. botulinus*. Spoilage of the causative food was recognized on opening the can in all except a very few instances, either on account of the rancid, offensive odor or of the physical disintegration of the contents of the can. In the case of spinach the odor may be so slight as to escape detection. Occasionally it was observed that food which produced toxic effects when warmed was eaten with impunity after being thoroughly boiled.

A bacteriological study of over 100 soil specimens collected in Yakima Valley explains the rather frequent development of botulism poison in underprocessed home canned vegetables and fruit. It is probable that *B. botulinus* is an inhabitant of the virgin soil. It may be mere coincidence due to the sampling, but the available data indicate that from the mountain ranges toward the valleys, following the descending course of the river, there is a progressive reduction in the infection of the soil. For example, virgin mountain soil contained *B. botulinus* spores in 83 per cent of the instances, while earth collected in the adjacent Tieton and Yakima Valley sections gave positive cultures in 57.1 per cent and 55.5 per cent of the trials, respectively. On the other hand, the Toppenish area, which is farther removed from the source of the Yakima River, supplied comparatively few infected soil specimens (11.7 per cent). Observations made in California and Wyoming confirm the data collected in Yakima and indicate that *B. botulinus* is a common anaerobe in the mountain soil. Studies thus far completed indicate that several areas in the United States may harbor comparatively few spores, and consequently botulism is either absent or is introduced with food products from territories in which the organism is common.

All observations of botulism indicate that the intoxication rate is very high; as a rule all who ate the poisonous food became ill. The number of fatal cases varied greatly in different outbreaks.

With reference to the presence of *B. botulinus* in food the following observations are made by Geiger:

Spores of the organism are sometimes quite abundant in soil and any food product soiled with earth can carry these potential elements. Moreover, it is well known that the spores of the majority of recently isolated strains are very resistant to heat. They share this property with the other representatives of the group of proteolytic anaerobes. Any method employed in the preservation of food which fails to consider these facts is apt to favor spoilage and, consequently, in a certain small percentage of instances, the growth of *B. botulinus* and its toxin. It can, therefore, be stated that in the majority of outbreaks underprocessed and therefore improperly preserved nonsterile vegetables and fruits have been the vehicles of the toxin. The conclusions apply to the commercially as well as to the home canned products. It is not surprising that the various home-canning procedures may be inefficient when it is realized that the commercial canning industry, which has for years labored with improved machinery, a trained personnel, and in many instances with scientifically controlled processes, has not entirely succeeded in obviating spoilage and with it the occasional occurrence of botulism.

Work with respect to the standardization of the antitoxin is now in progress (see Hygienic Laboratory report, p. 82).

INFLUENZA.

With the assistance of the Ohio State department of health, Asst. Surg. Charles Armstrong carried out a series of intensive epidemiological studies on influenza, as found in an isolated rural community at Kelley's Island, Ohio, from March, 1920, to May, 1921. Every possible factor influencing the spread of the disease was investigated, including the schools, gatherings, both public and private, milk, water, insects, crowding, economic status, and housing conditions. The conclusions drawn from this study are published by the service.¹

MALARIA INVESTIGATIONS.

At the close of the fiscal year 1920, investigations of malaria problems and demonstrations in malaria control were being actively conducted in the field, under the direction of Surg. L. D. Fricks, with headquarters at Memphis, Tenn. These investigations in malaria by the service may be conveniently considered under two broad, general heads, namely, (1) technical studies of malaria, (2) investigations and demonstrations of malaria-control measures. Dr. M. A. Barber, director of the malaria laboratory, has been in charge of scientific investigations of malaria during the fiscal year, and Senior Sanitary Engineer J. A. Le Prince has for many years been in charge of the studies of demonstrations in malaria control.

TECHNICAL STUDIES OF MALARIA.

Technical studies of malaria have been conducted (1) in the malaria laboratory at Eve Hall, Memphis, Tenn., and (2) in the field.

¹ Public Health Reports, July 22, 1921.

(1) LABORATORY INVESTIGATIONS.

The following studies were conducted by Associate Sanitarian Bruce Mayne at the Malaria Laboratory:

(a) *Longevity of Anopheline mosquitoes.*—Under artificial laboratory conditions it was found that *Anopheles punctipennis* lived a maximum of 230 days, the average life of 22 specimens being 100 days. Under the same conditions the average life of 4 specimens, *A. crucians*, was 65 days; and of 6 specimens, *A. quadrimaculatus*, 73 days.

(b) *Viability of malaria parasites in mosquitoes.*—The continuation of these investigations revealed nothing not previously reported. Disintegrated forms, probably of dead sporozoites, were found in the glands of three *A. punctipennis* dissected from the thirty-fourth to ninety-fifth day.

(c) *The blood picture of malaria.*—It was intended to collect and study 1,000 blood specimens from positive malaria patients with a view to determining the typical blood picture of this disease and its importance as a matter of diagnosis. Five hundred blood specimens were collected and a differential leucocyte count made of each. In several instances the percentage of large mononuclear leucocytes was 20 or more, while on the other hand it was often found below 4. This study has not yet been completed.

(2) FIELD INVESTIGATIONS.

Field investigations of malaria problems were conducted in person by Dr. M. A. Barber with such assistance as the limited allotment for this purpose would permit. Temporary field laboratories were established at Stuttgart, Ark., and Camilla, Ga. Because of the very wide scope of malaria problems yet unsolved, every effort was made to select those of practical importance and limit these scientific investigations to those lines which promise to throw additional light upon the pressing problems of malaria control. The following investigations of malaria problems were undertaken in the field:

(a) *Relation of domestic animals to the transmission of malaria.*—Following the investigations of Collaborating Biologist C. W. Metz, previously reported, relative to the attraction offered by some of the larger domestic animals to Anopheline mosquitoes, and more recent reports of French observers in this same field, it was deemed advisable to continue these investigations because of their possible practical bearing on malaria prevalence and control. Investigations of the relative attraction of human being versus domestic animals were conducted around Stuttgart, Ark., and in Mitchell County, Ga.; and while Anopheline mosquitoes were found to feed freely on these domestic animals, no conclusions were reached as to the feasibility of employing the larger domestic animals as a protection against malaria mosquitoes.

(b) *Observations on the dispersion of Anopheline mosquitoes.*—The object of these investigations was to gather further information concerning the habits of blood-fed *Anopheles*. Observations were conducted bearing upon the survival of Anopheline mosquitoes after feeding under the conditions ordinarily found in a poorly-screened

house, and of the factors which may increase or decrease the danger of malaria infections in the vicinity of a favorable mosquito-breeding place. These observations were conducted at Stuttgart, Ark., and will be continued in Mitchell County, Ga.

(c) *Winter activities of Anopheline mosquitoes.*—Many observations were made and data collected in southwest Georgia bearing upon this point, all of which indicated that Anopheline mosquitoes exhibit in southwest Georgia during the winter season every activity observed in summer—the processes, however, being more slow. The transmission of malaria during the winter season in that locality, however, is considered very doubtful.

(d) *Observations relative to early seasonal transmission of malaria.*—These observations were conducted in Mitchell County, Ga. Many Anopheline mosquitoes, especially the common spring species in this locality, *A. crucians*, were allowed to feed upon carriers of the common malaria infection during the spring months, i. e., benign tertian. Many infections of mosquitoes were obtained; but they resulted in a very small sporozoite production. These observations are being continued during the summer months in order to determine whether *A. crucians* readily mature sporozoites in warmer weather in this locality.

(e) *Observations on seasonal prevalence of different Anopheles species.*—These observations were conducted in Mitchell County, Ga. *A. crucians* were found to be the common species as late as the middle of June. These observations will be continued during the remainder of the year.

(f) *Larvicide experiments.*—A large number of substances were tested in the laboratory and in the field with a view to determining their toxicity to mosquito larvæ, and their adaptability as a larvicide. Results of these investigations are encouraging but require to be fully confirmed. Investigations of the possibility of employing certain fungi in the destruction of mosquito larvæ were conducted along with the investigations of chemical substances. This series of investigations is considered most important. Investigations are being continued and will form the subject of a full report.

RICE-FIELD INVESTIGATIONS.

The investigation of the relation of rice culture to the prevalence of malaria and the production of Anopheline mosquitoes, which has been conducted by the service in Arkansas, Louisiana, and California, was continued during the summer of 1920 by Plankton Expert W. C. Purdy around Chico, Calif. Investigation of this important health problem was discontinued during the present fiscal year, and the interesting observations made by Mr. Purdy around the rice fields of California are now being prepared as a separate report.

INVESTIGATIONS AND DEMONSTRATIONS OF MALARIA-CONTROL MEASURES.

MALARIA-CONTROL DEMONSTRATIONS PREVIOUSLY MADE.

The service has maintained its policy of discontinuing active supervision of malaria-control demonstrations at the end of the first

season's work, or as soon thereafter as possible, leaving the maintenance to the local authorities or commercial concerns interested; but when requested by the State health authorities such advisory supervision and reinspections of the work as were necessary to insure its successful completion have been furnished to the communities concerned. From incomplete reports received 15 communities are known to be continuing the malaria-control work which was initiated by the service as an extra cantonment health measure during the World War. At least 41 other communities in which malaria-control demonstrations were made by the service previous to 1920 are continuing active antimalaria work. Figures are not available from all of these communities, but 37 of them have reported appropriations amounting to more than \$129,100 as having been made for the maintenance of this work during 1921.

The inauguration of cooperative demonstrations in malaria control as entered into by the service in 1920 was described in the last annual report, but no statistical data relative to these demonstrations were available at the time the report was submitted. This data for 1920 has now been compiled from which the following has been selected:

Demonstrations were conducted in 45 towns located in ten different States. A total area of 192 square miles was under control, and a population of almost 200,000 was protected from malarial infections at a cost of \$161,127, or a per capita cost of 80 cents, and a per acre cost of \$1.31. These figures represent the cost during the initial year (1920) of malaria control in these urban communities and include a considerable expenditure for drainage work which will not be necessary in succeeding years.

TABLE A.—*Cooperative demonstrations begun in 1920.*

State.	Number of demonstration towns in 1920.	Area controlled (square miles).	Population protected.	Cost initial year (1920).			Number of towns continuing work in 1921.	Estimated cost second year (1921).		
				Total.	Per acre.	Per capita.		Total. ¹	Per acre.	Per capita.
Alabama.....	6	26.0	27,057	\$18,217.95	\$1.09	\$0.67	5	\$4,550.00	\$0.36	\$0.19
Arkansas.....	4	15.0	15,225	8,963.86	.93	.59	3	6,000.00	.78	.29
Georgia.....	3	24.5	21,659	9,191.08	.59	.42	2	5,300.00	.41	.24
Louisiana.....	3	17.5	35,673	15,325.29	1.37	.43	1	3,346.00	1.16	.15
Mississippi.....	5	13.3	20,024	12,663.52	1.49	.63	5	2,467.00	.29	.12
North Carolina.....	3	11.0	19,100	24,018.42	3.41	1.26	3	10,200.00	1.45	.53
South Carolina.....	3	22.5	12,100	42,091.23	2.92	3.48	3	10,540.00	.73	.87
Tennessee.....	2	8.9	9,604	4,227.38	.74	.44	1	1,200.00	.37	.18
Texas.....	14	49.0	36,813	20,179.33	.64	.55	13	5,954.00	.21	.18
Virginia.....	2	4.2	2,475	6,249.56	2.33	2.52	1	1,200.00	3.12	.73
Total....	45	191.9	199,730	161,127.62	1.31	.80	37	50,757.00	.52	.28

¹ Amounts either actually appropriated or estimated as necessary.

The value of these cooperative demonstrations has been shown in many ways. The prevalence of malaria in these towns has been markedly reduced. Malaria morbidity data collected by the State and city health authorities from physicians' reports and by house-to-house canvasses indicate reductions in malaria incidence in 1920 of over 75 per cent in many of these towns and of over 90 per cent in

some of them, as compared with the 1919 malaria rate. House-to-house canvasses in several of the towns in which cooperative malaria control demonstrations were conducted revealed the fact that the economic loss directly due to malaria, including doctors' fees, medicine bills, and wages lost by forced absence from work were so greatly reduced that the investment for malaria control resulted in an actual saving of several times the amount expended for this purpose; and in one case to over eight times the amount of the investment made by the community in protecting its health. It should not be forgotten that the losses as given are direct losses due to malaria and those easily ascertained.

In the saving to the community no attempt is made to estimate gains resulting from increased agricultural and industrial production; a greater volume of business in the community; increased freight revenue by the railroads; increased real estate values and rentals; and, above all, improved living conditions and better health for the community as a whole. Many expressions of approval have been received from the citizens in towns in which this work has been conducted indicating their satisfaction of results obtained in the reduction of malaria, the economical savings effected, the absence of mosquito pests; and have urged that the work be continued in future years. That these demonstrations in malaria control prove their value to the citizens of the towns in which they were conducted is very definitely shown by the fact that 37, or 82 per cent of the 45 towns, have appropriated necessary funds for continuing malaria control work during 1921 in spite of the widespread financial depression. Many of the towns concerned preferred to discontinue other municipal activities of much longer precedent, because they were convinced that malaria control was more important to their immediate needs. A total sum of \$50,757 was appropriated for the maintenance of malaria control in these 37 towns during 1921, the estimated per capita cost of the maintenance work being \$0.28, and the per acre cost \$0.52.

COOPERATIVE MALARIA-CONTROL DEMONSTRATIONS UNDERTAKEN IN 1921.

In carrying out the cooperative program of malaria-control demonstrations as entered into by the United States Public Health Service, State and local health authorities, and the International Health Board, two serious difficulties were encountered at the beginning of the 1921 malaria season. These were: The wide-spread financial depression throughout the South, and an inadequate allotment for additional sanitary engineers to serve as field directors of new work. After careful consideration, it was deemed of greatest importance that the demonstrations in malaria control previously made be assured of successful maintenance, and that new demonstrations be undertaken in a conservative spirit. Following this decision, preliminary surveys were made in 118 urban communities, and as a result of the information gathered in these surveys, 25 towns located in 9 States were selected for new malaria-control demonstration purposes. In these 25 new towns, a total area of 78.5 square miles is under control, and a population of 70,557 is being protected against malaria. In the majority of these towns, the funds necessary for malaria control have been appropriated by the communities them-

selves, but in some instances financial assistance is being given as heretofore by the States and the International Health Board. Of the total appropriation, amounting to \$59,705.44 for new demonstrations in malaria control, \$40,595.30 has been secured from local sources; \$9,555.07 from the different State health departments concerned; and \$9,555.07 from the International Health Board. As showing an increase in local appropriations for malaria control, these figures compare very favorably with those expended for the same purpose during 1920, which were as follows: Total appropriation for 1920 demonstrations in malaria control, \$161,127.62; \$122,819.43 secured from State and local sources; and \$38,308.19 from the International Health Board.

The per capita cost in malaria-control demonstrations in these 25 new urban communities amounts to 85 cents; the per acre cost \$1.19 for the initial year's work. The following table gives all the information available at the present time, mid-season, relative to the 1921 cooperative demonstrations in malaria control.

TABLE B.—Cooperative demonstrations begun in 1921.

State.	Number of towns surveyed.	Number of towns selected.	Area controlled (square miles).	Population protected.	Appropriations, 1921.				Estimated cost initial year (1921).		Expended to June 31, 1921.
					Local.	State.	International Health Board.	Total.	Per acre.	Per capita.	
Alabama....	37	4	4.0	3,910	\$1,820.00	\$910.00	\$910.00	\$3,640.00	\$1.42	\$0.93	\$1,007.58
Arkansas....	6	2	7.0	6,700	5,055.65	.....	.....	5,055.65	1.13	.75	2,017.61
Georgia.....	7	2	10.0	5,560	5,500.00	.....	.....	5,500.00	.86	.84	2,860.00
Louisiana....	3	1	10.0	15,000	2,869.69	1,397.00	1,397.00	5,663.69	.88	.38	3,710.82
Mississippi...	10	4	12.0	11,976	6,400.00	2,600.00	2,600.00	11,600.00	1.51	.97	4,091.09
North Carolina....	5	1	3.5	2,000	3,321.14	1,660.57	1,660.57	6,642.28	2.97	3.32	4,512.90
South Carolina....	9	2	8.5	3,788	3,075.00	1,537.50	1,537.50	6,150.00	1.13	1.62	1,746.33
Tennessee....	6	2	8.0	9,100	4,100.00	1,450.00	1,450.00	7,000.00	1.37	.77	2,630.66
Texas.....	23	7	15.5	11,523	8,453.82	.....	.....	8,453.82	.85	.73	5,730.57
Virginia.....	12	(¹)	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals....	118	25	78.5	70,557	40,595.30	9,555.07	9,555.07	59,705.44	1.19	.85	28,307.56

¹County-wide demonstrations being conducted in two counties.

As a result of cooperative demonstrations in malaria control made in 1920, many towns and industrial plants have undertaken malaria control work this year on their own initiative without asking any outside financial assistance. Many of these have requested, however, that general supervision and necessary advice for the proper conduct of their antimalaria work be given them. The sanitary engineers in the field have been instructed to comply with all reasonable requests of this character.

MALARIA AND MOSQUITO CONTROL AROUND SERVICE HOSPITALS.

Early in the fiscal year the medical officer in charge of field investigations of malaria was placed in supervisory charge of all anti-malaria work to be done on the grounds and in the immediate vicinity of certain hospitals operated by the service. During the

year supervisory charge of antimalaria work was undertaken at the following hospitals:

- Hospital No. 25, Houston, Tex.
- Hospital No. 26, Greenville, S. C.
- Hospital No. 27, Alexandria, La.
- Hospital No. 29, Sewells Point, Va.
- Hospital No. 35, St. Louis, Mo.
- Hospital No. 40, Cape May, N. J. (discontinued).
- Hospital No. 42, Perryville, Md.
- Hospital No. 44, West Roxbury, Mass.
- Hospital No. 62, Augusta, Georgia.

In order to economically conduct this work the field director in charge of cooperative malaria control work nearest each hospital was directed to confer with the medical officer in charge of the hospital, make necessary malaria surveys, prepare estimates of cost for antimalaria work, to reinspect the work from time to time, and advise concerning its successful prosecution; \$17,341.60 was appropriated for actual antimalaria work around these hospitals during the fiscal year ending June 30, 1921; and \$15,437 estimated for the same work during the next fiscal year.

INVESTIGATIONS OF MALARIA AS AFFECTING RAILROADS ENGAGED IN INTERSTATE TRAFFIC.

It has not been found difficult to interest the larger railway systems of the South in malaria control from an economic standpoint. In addition they offer an easy avenue of approach through which demonstrations in malaria control can be cheaply made to the people of the many small towns scattered along their lines. For these reasons malaria surveys have been made of the larger railway systems whenever available personnel would permit. The scope of these malaria surveys has been as follows:

- (a) Determine as accurately as possible malaria prevalence among railroad employees.
- (b) Outline the extent of the malaria problem along the road.
- (c) Make necessary recommendations for practical malaria control.
- (d) Prepare an estimate of the cost for malaria control.
- (e) Inaugurate a campaign for malaria control.

Such malaria surveys have already been made of three railway systems of the South, two of which are now taking effective precautions to protect their employees. In addition the roads are educating the people along their lines in malaria transmission, malaria importance, and malaria control. They are supporting the State and local health authorities in their efforts to secure adequate appropriations for malaria control, and in some instances they are assisting towns along their lines in financing their antimalaria operations. The St. Louis & Southwestern Railway has been particularly active in these matters, and in addition to starting many towns and communities in taking up their local malaria problems it has been a great support to the State health authorities in creating public sentiment for malaria control and a public demand for increased malaria appropriations. This has occurred in a section of the coun-

try where a few years ago the majority of the people believed that malaria was due to miasma, watermelons, and bad drinking water. Indications are that when the present financial depression has abated, it will be difficult to meet the demands of the railroads of the South for sanitary engineers with which to make malaria surveys of their roads.

IMPOUNDED WATER SURVEYS.

The water power possibilities in the foothills of the Appalachians are enormous and their development is rapidly progressing. This development will no doubt increase as the cost of other motor power increases. In connection with the impounding of water in countries potentially malarious there frequently follows the danger of creating a focus of malaria infection, or greatly increasing the malaria present in that locality. In order to minimize this danger, investigations have been made in order to determine effective and practical means of controlling Anopheline production around impounded water projects. These investigations have been continued for several years by means of surveys made of various impounded water projects of the Appalachian region. During the year malaria surveys were made of impounded water projects at Baden, N. C.; Wateree, S. C.; Muscle Shoals (Wilson's Dam), Ala.; Newport News Water Co., Newport News, Va., Norfolk waterworks, Princess Anne County, Va.; Lake site below Lock 12 on Coosa River, Ala.

A request was received from the Water Power Commission that regulations be prepared by the service for the protection of health conditions around impounded water projects. In conformity with this request, regulations were prepared and submitted to the Water Power Commission.

INVESTIGATIONS OF MALARIA IN RURAL DISTRICTS.

Investigations of malaria in Mitchell County, Ga., previously reported (see Annual Report for 1920) were continued during 1921. The original program of this work contemplated the selection of a small rural area and there making a careful investigation of losses from malaria and an intensive study of malaria control through education, screening, and quinine administration. This was done in 1919. In 1920, however, the demand from the people of Mitchell County for relief from the malaria situation became so urgent that this program was changed in order to convert it into a program for the eradication of malaria infection carriers through the general administration of quinine throughout the county. During 1920, 600,000 doses of quinine were distributed, free of cost, to the applicants for treatment, the quinine being furnished by State and local authorities; 10,239 applicants were treated out of a strictly rural population of 18,952 and a total population of 25,254 in Mitchell County. Fourteen free dispensaries were established for the distribution of the quinine. The total cost to the cooperating agencies of this experiment was \$15,418.89, of which \$7,054.46 of the funds supplied by State and local agencies were spent for quinine and supplies, and \$1,500 was expended for transportation. The per capita cost for each person taking the treatment was approximately \$1.50. It was conservatively estimated that the elimination of malaria carriers by

this demonstration in Mitchell County brought about an economic gain during 1920 of \$270,000, or some 17 times the amount invested.

FISH IN RELATION TO MOSQUITO CONTROL.

The Bureau of Fisheries continued its cooperation in the investigation of fish in relation to mosquito control by again detailing Ichthyologist Samuel F. Hildebrand to continue his observations and studies, particularly of *Gambusia affinis*. The cooperation of the Bureau of Fisheries and Mr. Hildebrand has been most valuable. The conditions under which *Gambusia affinis* can be effectively employed in reducing mosquito production are being more clearly defined and their field of usefulness for this purpose considerably extended. Various State and local health authorities as well as industrial concerns have been interested in the installation of *Gambusia* hatcheries as an addition to their equipment in fighting malaria and pestiferous mosquitoes. Mr. Hildebrand conducted special investigations of *Gambusia affinis* and allied fishes during the year at Savannah and Augusta, Ga.

In connection with the broader employment of fish in the control of mosquito production, observations made by Senior Sanitary Engineer J. A. Le Prince, while on duty with the Quarantine Division of the service this year, are extremely interesting. Mr. Le Prince found in Tampico, Mexico, that the production of mosquitoes, principally *Aedes argenteus*, in water barrels and similar containers was effectively controlled by the placing of a small number of top minnows in each container, and that this method was much more satisfactory to the householders than had been those previously employed, i. e., periodical oiling or emptying. Mr. Le Prince made the same observations in Laredo and Brownsville, Tex. In Laredo a survey was made of 225 city blocks, in which 1,126 artificial containers were found producing mosquitoes. Two *Gambusia affinis* were placed in each of these containers and mosquito production in this way effectively controlled.

PELLAGRA.

FIELD INVESTIGATIONS.

At the close of the fiscal year 1920 the following field investigations of pellagra were under way:

1. A study of the preventive value of selected food factors.
2. A study of the relation of certain seasonally varying factors in relation to pellagra incidence in a selected cotton-mill village of South Carolina.

The study of the pellagra preventive value of certain single foods when forming a supplement to the regular ration of a selected group of inmates of the Georgia State Sanitarium, begun about January 1, 1918, and continued through the fiscal year 1920, in immediate charge of Passed Asst. Surg. W. F. Tanner, was modified during the fiscal year under present consideration so as largely to restrict it to a study of the preventive value of certain vitamine-rich foods and more particularly to the study of the preventive value of a mixture of inorganic salts resembling that of the mineral matter of milk.

Thanks to the cooperation of the trustees and staff of that institution this important line of investigation was carried on under very

favorable conditions. Although by reason of the seasonal character of the disease the study was still in progress at the close of the fiscal year, results, confirmatory of those previously recorded, indicating that a deficiency of neither vitamine-B nor vitamine-A is an essential factor in the causation of the disease, together with results of importance relative to the mineral factor are clearly foreshadowed. This will be of great importance in that it will permit of greatly restricting the field within which the essential etiological dietary factors of the disease must hereafter be sought, and thus to that extent hasten the ultimate solution of this problem.

The study of various factors in relation to pellagra incidence in cotton-mill villages begun at Spartanburg, S. C., in the spring of 1916, in immediate charge of Passed Asst. Surg. G. A. Wheeler, and carried on on a considerable scale during 1917 and 1918, was restricted to one village during the fiscal year 1920. On this reduced scale it was continued to October 1, 1920, which date, it had been planned, was to mark the completion of this line of investigation.

But at about this time there began the economic depression which has slowed down industry and brought about unemployment throughout the country. This depression seriously affected among others the cotton-textile milling industry of the South. In the light of the indications of the studies already made it appeared highly probable that a continuance of this depression would lead to an increase in the prevalence of pellagra in 1921. As it seemed highly desirable to study the effects of this depression and to check the effects anticipated from theoretical deductions by actual observations, bureau and department approval were secured for a resumption of the study.

Accordingly the population of the village observed up to October 1, 1920, was again taken under surveillance on January 1, 1921, and the collection of the various classes of pertinent data begun. This study was still in progress at the close of the fiscal year, at which time there was already at hand evidence of a marked increase in incidence of pellagra over that observed during 1919 and 1920.

The data resulting from the field studies accumulated at field headquarters at Washington were the subject of continuous study throughout the year. Some of the results were published and others were being arranged in form for publication.

SPECIAL STUDIES OF PELLAGRA AT SPARTANBURG, S. C.

The special studies at the service hospital and laboratory at Spartanburg, S. C., begun in 1914, were discontinued early in the fiscal year and the hospital closed, in accordance with the directions of Congress, on December 31, 1920. The records and data were transferred to the field headquarter's office at Washington. Reports on the clinical data collected at the hospital during the period of its service are being prepared for publication by Passed Asst. Surg. G. A. Wheeler, and on the chemical data by Biochemist M. X. Sullivan. Some of the latter have already been published.

PLAGUE.

A number of samples of antiplague serum were tested for potency as a part of the work of the control of biologic products. While

there is no established standard of potency for this serum, it is possible to determine roughly the protective value of a given sample and this has been done both with regard to specimens made by officers of the service and that produced by commercial firms. Three officers were detached from the laboratory to proceed to the Gulf coast when plague appeared at Beaumont and Galveston, Tex., and Pensacola Fla., for the purpose of carrying on research projects in connection with the work of the plague laboratories. At the Pensacola laboratory a considerable amount of immunological work was done, but the results were not sufficiently definite to warrant publication. The director of the Hygienic Laboratory acted as consultant in laboratory work at the various laboratories of the service engaged in plague work. (See report of Hygienic Laboratory, p. 86.)

TRACHOMA.

The trachoma prevention work during the fiscal year 1921 has resulted in the treatment of practically the same number of patients as in the year 1920, in spite of the fact that there has been a reduction in the amount of field work.

Hospitals.—Five hospitals have been in operation at Greenville, Ky., Jackson, Ky., Pikeville, Ky., La Moure, N. Dak., and Morristown, Tenn. These hospitals are serving a very valuable purpose, as is shown by the report that 1,115 new cases of trachoma applied for and received treatment during the year. The seriousness of the situation is indicated by the fact that of this number more than 3 per cent of the new cases had lost either one or both eyes from the disease; more than one-half suffered impairment of vision from trachoma; nearly one-third of the new cases of trachoma had pannus, a condition pathogenic of trachoma; and about one-half had photophobia. The number of cases of trachoma cured during the year amounted to over 300. In curing existing cases, the foci of infection are reduced and the method of handling this communicable disease is demonstrated, with the idea of making the public-health phase of the work the paramount feature.

Clinics.—Two field clinics or temporary hospitals were conducted during the year, one at Red Lake Indian Reservation, Minn., and the other at Carthage, Tenn., where the State and local authorities appropriated money to establish and conduct a small hospital which was in operation six months.

Field clinics.

Number of clinics held.....	33
Number of people examined, all ages.....	10,890
Trachoma cases found.....	980
Suspicious cases found.....	144
Operations performed:	
General anesthesia.....	415
Local anesthesia.....	270
	<hr/>
	685
Attendance at clinics.....	5,179
Physicians present.....	387
Public talks given.....	16
People (estimated) in audiences.....	1,904

*Surveys made by the United States Public Health Service in Tennessee,
Alabama, and Arkansas.*

Schools examined.....	129
Pupils examined.....	7,893
Cases trachoma found.....	402
Suspicious cases found.....	98

TABLE 1.—Dispensary and hospital relief, operations, etc.

	Green- ville, Ky.	Jackson, Ky.	LaMoire, N. Dak.	Morris- town, Tenn.	Pikeville, Ky.	Total.
DISPENSARY RELIEF.						
Old cases, all causes.....	410	3,183	273	1,354	1,273	6,493
Old cases, trachoma.....	226	2,336	169	1,099	694	4,524
New cases, all causes.....	559	923	487	744	1,567	4,280
New cases, trachoma.....	125	284	307	202	197	1,115
Total attendance.....	969	4,106	760	2,098	2,840	10,773
Total number of treatments.....	983	4,631	760	2,175	2,930	11,479
Average daily attendance.....	3	13	2	7	9	34
Cases impaired vision from trachoma.....	82	132	83	61	180	583
Cases corneal opacity from trachoma.....	56	83	32	26	28	225
Cases blindness both eyes from trachoma.....	2	2	1	-----	3	8
Cases blindness one eye from trachoma.....	7	3	-----	1	16	27
Cases ulcer from trachoma.....	40	75	14	16	32	177
Cases pannus from trachoma.....	49	110	31	10	114	314
Cases entropion from trachoma.....	29	41	5	17	26	118
Cases trichiasis from trachoma.....	7	31	1	6	17	62
Cases photophobia from trachoma.....	73	191	31	125	131	551
Cases conjunctivitis.....	148	316	43	290	508	1,305
Cases glaucoma.....	1	-----	-----	1	1	3
Cases trachoma cured.....	68	91	39	30	64	292
HOSPITAL RELIEF.						
Cases remaining from previous year.....	9	10	8	-----	15	42
Cases admitted during the year.....	145	280	159	173	351	1,108
Cases discharged during the year.....	144	281	158	166	347	1,096
Cases remaining at close of the year.....	10	9	9	7	19	54
Days relief furnished.....	2,570	3,491	3,788	3,066	6,419	19,334
Rations furnished.....	4,284	5,439	5,182	4,148	8,297	27,350
Cost of rations furnished.....	\$2,956.06	\$2,748.38	\$1,993.86	\$1,900.85	\$4,035.39	\$13,634.54
OPERATIONS.						
Operations under general anesthesia.....	19	17	19	29	51	135
Operations under local anesthesia.....	74	241	107	171	244	837
Operations with grattage method.....	76	225	117	183	188	789
Operations for entropion.....	22	27	6	10	32	97

Cooperation of States.—The States of Ohio and Kentucky now have trachoma bureaus under the department of health. At the request of the commissioner of public institutions of the State of Kentucky, a trachoma survey was made of the public institutions in that State and the service rendered such aid and cooperation in eradicating trachoma in the public institutions as would prevent the further spread of the disease.

TYPHOID FEVER.

Washington and Frederick Counties, Md.—Asst. Surg. R. B. Norment, jr., serving as epidemiological aid in the State of Maryland, made a study of an endemic focal history in the routine investigation of rural typhoid in Washington and Frederick Counties, Md., during the early part of the fiscal year.

The following points were developed in this investigation:

(1) That during the last five years cases of typhoid fever have been characteristically distributed in distinct groups suggesting local foci.

(2) That a systematic investigation of the cases occurring during the past year has resulted in revealing sources of infection competent to account for more than 50 per cent of all cases.

(3) That association with a bacteriologically demonstrated chronic carrier was found in one-third of all the cases investigated.

(4) That the demonstration of these carriers involved relatively few bacteriological examinations, because the epidemiological evidence was usually sufficient to exclude all but a very few individuals from consideration as probable carriers.

The importance of the study lay chiefly in its suggestion that equally careful study of endemic rural typhoid in other areas may be expected to result in discovering a considerable proportion of the chronic carriers who must be a factor of major importance in the spread of typhoid fever in rural communities.

Fort Smith, Ark.—At the request of the Arkansas State health authorities Asst. Surg. Thomas Parran, jr., made a survey of conditions in Fort Smith, Ark., during October, 1920, with a view to fixing the cause of an outbreak of typhoid in that city. It was found that the water supply was unsafe from a public health standpoint, but that the plans which were underway for its improvement would no doubt be effective. The source of infection in this case was found to be milk.

Salem, Ohio.—In November and December, 1920, in cooperation with the Ohio State health authorities, Associate Sanitary Engineer R. E. Tarbett conducted an investigation into the causes of a typhoid epidemic in Salem, Ohio, which was found to be due to polluted water.

PARATYPHOID.

In November, 1920, Passed Assist. Surg. Fred T. Foard undertook an investigation in Cascade, Mont., in response to a request from the State and local health authorities for assistance in instituting quarantine measures on account of 30 cases of influenza. A study of these cases disclosed the fact that the disease was not influenza, but paratyphoid, caused by eating infected headcheese. This report demonstrated the importance of careful epidemiological investigations of food supplies along with the usual investigations that are made of water and milk supplies in connection with such outbreaks of paratyphoid, typhoid, and other epidemic intestinal diseases.

YELLOW FEVER.

In the early part of 1921 Senior Sanitary Engineer J. A. Le Prince cooperated with authorities of Tampico, Mexico, in a highly successful campaign against yellow fever. At the request of the Texas State Board of Health, Mr. Le Prince also supervised a campaign for the elimination of the breeding places of the yellow-fever mosquito in the Texas border towns, including Laredo and Brownsville.

INDUSTRIAL HYGIENE AND SANITATION.

During the fiscal year 1920-21 the Office of Industrial Hygiene and Sanitation functioned with headquarters at Washington, D. C.,

various field activities being directed into occupational health hazards and other subjects coming under the scope of industrial hygiene. Sanitarian (R) Bernard J. Newman was in temporary charge until January 1, 1921, when, upon his resignation, Acting Asst. Surg. William J. McConnell served in this capacity until relieved from temporary charge by Surg. L. R. Thompson, who assumed charge of the activities of this office on April 6, 1921. Assistant Sanitarian (R) William G. Beucler served as executive officer throughout the entire year.

Activities conducted by this office include: (1) Surveys into occupational health hazards in industrial plants; (2) studies of special occupational diseases; (3) investigation of working and sanitary conditions obtaining in Government buildings; (4) consulting service to industries, industrial workers, and to State and municipal authorities and various governmental agencies on occupational diseases and other problems arising in connection with the safeguarding of health of industrial workers; (5) supervision of medical and surgical relief service work at certain stations under the jurisdiction of the United States Employees' Compensation Commission, in conformity with the provisions of the act of September 7, 1916; and (6) miscellaneous activities.

I. STUDIES OF OCCUPATIONAL DISEASES.

A. LEAD POISONING.

(1.) *Lead poisoning in connection with pottery production.*—Field work in connection with this study, which was instigated at the request of the Brotherhood of Operative Potters, and seconded by the State Department of Labor of Pennsylvania, relative to the incidence of lead poisoning among workers engaged in the pottery industry, was completed during the fiscal year 1919–20, but it was not possible to make necessary statistical computations and complete the writing of the report of this study until January, 1921.

The scope of this survey included analyses of plant working conditions, personal service facilities, and physical examination of the workers, together with necessary laboratory determinations incident to the analyses of samples of glaze and other substances. One thousand eight hundred and nine employees in the pottery industry in the States of Pennsylvania, Ohio, New Jersey, and West Virginia, these being the centers of pottery production in the United States, were given physical examinations. This number constitutes 94.6 per cent of the employees who were exposed to the lead hazard, approximately 20 per cent being women. It was found that 15 per cent of the employees examined had lead poisoning in some degree. Dipping is the most hazardous occupation among pottery workers as indicated by the record of lead poisoning, with glaze mixing following a close second. The complete report of this study is now on the press and will be published shortly as Public Health Bulletin No. 116, "Lead Poisoning in the Pottery Trades."

(2.) *Poisoning due to carbonated water containing lead.*—A special investigation of poisoning caused by the use of carbonated water containing lead was made during the course of the year. It appears that the proprietor of a pharmacy and certain members of his

family were found to be suffering from lead poisoning, this being drawn to the attention of Consulting Hygienist C.-E. A. Winslow during the course of other research work, and the investigation was conducted to determine, if possible, the cause and prevention in this connection. Upon elimination of all other factors it was decided to analyze the carbonated water which was being used. A portion of the carbonating machine had been repaired with a metal which upon analysis proved to contain lead. Report of this study will appear in the Public Health Reports after the necessary repairs have been made to the carbonating machine and subsequent analysis made of the water.

B. INVESTIGATIONS INTO INDUSTRIAL FATIGUE.

These studies were continued during the entire fiscal year on a considerably reduced scale owing to curtailed appropriations, under the direction of Senior Physiologist (R) Frederic S. Lee, assisted in these studies by Associate Physiologist (R) A. H. Ryan and Associate Sanitarian (R) P. S. Florence.

As a result of activities previously conducted in connection with industrial fatigue, it was decided to prepare reports on four distinct subjects covering (1) rhythm in industrial operations; (2) spoiled work and fatigue; (3) individual variation in output; (4) effect of overtime in reducing rate of output. Scientific Asst. Edward M. Martin is assisting in the preparation of the reports in question. It is planned to publish these reports as Public Health bulletins of the service and it is believed that they will be ready for the press some time during the early part of the ensuing fiscal year.

Laboratory studies relating to the chemical phenomena of industrial fatigue were conducted by Asst. Chemist (R) A. B. Hastings, with the advice and volunteer assistance of Asst. Prof. Ernest L. Scott, of the College of Physicians and Surgeons, New York City. The results of this study were published during the year as Public Health Bulletin 117, entitled "The Physiology of Fatigue."

C. INK DERMATOSES AMONG PLATE AND PRESS PRINTERS.

The investigation of causation of an alleged ink dermatosis among plate and press printers working in colored inks, conducted at the request of a Government plant, which was begun during the latter part of the fiscal year 1920, was completed during the past year. Numerous analyses of colored inks, oils, and soaps were made and experiments were conducted with a view of ascertaining the ingredients possibly causing the condition. Members of the corps who volunteered were subjected to tests by applying certain inks to the posterior surface of the forearm about midway between the wrist and elbow and noting the reaction. Applications were repeated daily for a period of from one to four weeks, the ink not being removed during the period in question. No irritation resulted, and another series of experiments were carried on, differing in that the ink was removed each evening with soap and water and with the aid of a brush. In another series of experiments the skin was first irritated and in some cases the surface was abraded and the ink then applied. A control was made in each instance by abrading

another area and applying oil. The surfaces where oil was applied healed in a short time, while those where the ink was applied required from three to five days longer to effect healing, this being particularly so in the case of the green and brown inks.

Employees engaged in working with inks used sand, pumice, hard soaps, and hand brushes in order to effect removal of the inks. This rough treatment was eliminated and a test made with a cleaning mixture composed of sawdust and liquid green soap, warm water to be used in cleaning. This was found to be very effective, and still more so by applying lanolin or lanolin ointment to the surfaces before entering the workroom. The cleansing treatment was used at the luncheon period and at the end of each shift, lanolin being applied in each instance before returning to work. A gelatine and calamine paint was experimented with in the case of employees who were suffering with severe skin lesions and very satisfactory results obtained.²

The preventive measures recommended consisted of applying lanolin, or a mixture of lanolin and olive oil in equal parts, before entering the work room and at the luncheon period, and a mixture of sawdust and liquid soap, in conjunction with warm water, used in removing the inks without injury to the skin.

D. CUTTING OIL DERMATOSES.

Investigation of the cause of dermatosis among machinists and others using cutting oils and compounds, which was begun during the fiscal year 1920, was temporarily discontinued owing to lack of funds to carry on the study until late in February, 1921, when Passed Asst. Surg. (R) William J. McConnell was assigned the task of continuing the study. Revisit was made to certain of the industrial plants where original contact was made and examinations were made of workers exposed to oils, compounds, and greases in connection with their work. Analyses of the various processes were made to aid in ascertaining the irritant agent or agents since bacteriological tests showed that over 80 per cent of the cases observed were not of bacterial origin. A report of the work conducted on this study is now in process of preparation.

E. INDUSTRIAL DERMATOSES.

The program of the office for the fiscal year 1921 contemplated undertaking the study of occupational dermatoses on a rather large scale; however, curtailed appropriations and work of a more important nature necessitated that such study be given minor consideration until such time as it would be possible to proceed with the investigation on a firm and well-organized basis. Therefore, a questionnaire was drawn up and forwarded with a letter outlining the contemplated activities of the service in this connection to a large number of representative industrial establishments, such as automobile, canning, leather, electrical, paint, rubber, printing, chemical, glass, dye, storage battery, and other industries, in order to provide

² Industrial Dermatoses Among Printers, Reprint No. 656, Public Health Reports, May 6, 1921.

for collection of as much preliminary information on industrial dermatoses as possible so that such may be available when active field work is inaugurated. At intervals the study of literature bearing on dermatoses was continued. Numerous inquiries were received from manufacturers requesting information and advice on conditions existing in their plants. Compilation has been made of a large number of fumes, gases, chemicals, and other substances which are alleged to be causative agents in producing trade dermatoses.

II. SURVEYS INTO INDUSTRIAL HEALTH HAZARDS IN INDUSTRIAL PLANTS.

A. SURVEY OF THE GLASS INDUSTRY.

A survey of the occupational health hazards in the glass industry was inaugurated in February, 1921. Plants engaged in the manufacture of various glass products, including cut glass, bottles, and flint wares, located in the States of New York, New Jersey, Pennsylvania, West Virginia, Ohio, and Indiana, were visited. Plant processes were analyzed with special reference to the heat hazard, and physical examinations were conducted, together with laboratory analyses of various substances, including dust samples. Physical examination of 1,158 workers were made, 16 of whom were women. The survey included all phases of plant working conditions with respect to direct or indirect factors which might affect the health of the employees. Active field work and laboratory determinations will be completed during the early part of the ensuing fiscal year. Statistical and interpretive work will be undertaken immediately upon the completion of the survey and a report prepared for publication.

B. AIR CONDITIONING AND DUST CONTROL.

Studies into air conditioning were continued by Scientific Asst. Leonard Greenburg, under the immediate supervision of Consulting Hygienist C. E. A. Winslow at the Yale University Medical School, New Haven, Conn.

Numerous experiments in connection with the distribution of air by means of straight and tapered ducts were conducted following reassembling of the apparatus designed for the purpose. Experiments were made with the Kata thermometer to ascertain its sensitivity and accuracy in determination of rate of heat loss. Air flow measuring devices were installed and a series of experiments are being conducted to ascertain whether or not the Kata thermometer will serve as an anaemometer for air currents having velocities below 500 feet per minute. A Konze Konimeter has been procured from the manufacturers in South Africa with a view of testing it as to piston speed, air velocity, and general characteristics to determine its advantages, if any, over the Palmer dust sampling apparatus. A study was conducted at a large axe factory to determine whether or not the process of wet grinding really involves a serious health hazard of industrial tuberculosis.³

³A Study of the Dust Hazard in the Wet and Dry Grinding Shops of an Axe Factory—Reprint 616, Public Health Reports, October 8, 1920.

C. FIELD STUDIES IN CONNECTION WITH SURVEY OF OCCUPATIONAL HEALTH HAZARDS IN THE FOUNDRY TRADES.

Field studies in connection with survey of occupational health hazards in the foundry trades were practically completed in June, 1920, with the exception of air tests for carbon monoxide and special dust study of sand-blast operations, and finally intensive laboratory experimentation relative to zinc poisoning in connection with brass and zinc workers.

Analysis of air samples and of dust samples has been completed, but owing to special work of a more urgent nature and curtailment of funds, it became necessary to confine further work on this study to the writing up of certain sections of the report until after the close of the fiscal year 1921. Plans are now under way for carrying on intensive animal experiments in connection with the zinc studies. This is an unexplored field and offers an excellent opportunity to conduct a constructive piece of research work. It is proposed to begin these studies about November 1 of the ensuing fiscal year.

D. SPECIAL INDUSTRIAL HYGIENE SURVEY.

At the request of Dr. R. N. Greene, State health officer of Florida, an officer was detailed to Perry, Fla., to confer with the representatives of the State board of health, with a view of assisting in the development of a program of industrial hygiene. A survey was made of lumber camps in this area, and upon the completion of this work a subsequent request was made for the further detail of this officer to Brewster, Fla., for the purposes of making a survey of the phosphate mines at that point, and to Tampa and vicinity, to conduct an investigation of the cigar and cigar-box factories. An intensive survey of the medical and surgical relief services, together with survey of sanitary and hygienic working and living conditions of the employees was made. Two lumber camps, four phosphate mine plants, and nine cigar and cigar box factories were included in the survey. Seven hundred workers in the cigar and cigar box industries were given physical examinations. Statistical compilations are in progress, and it is contemplated correlating this data with that collected in a previous survey of certain cigar factories in one of the northern States and to render a complete report of the findings in the cigar industry as a whole.

E. STUDY OF HEAT HAZARD IN INDUSTRIES AND PREVENTIVE MEASURES.

Although this study was included in the program for the fiscal year 1921, owing to lack of funds and because of other work of pressing nature, it was found impossible to do other than review work previously done on this subject and to compile necessary bibliographical data. The survey of occupational health hazards in the glass industry being in progress, and a possible heat hazard being presented in this industry, general studies into the heat hazard in industry were discontinued until such time as funds may be available to undertake the work. Such will be undertaken if an opportunity presents itself during the ensuing fiscal year.

A study of the urine and blood of subjects exposed to high temperatures, in addition to muscular activity, was begun by Asst.

Chemist A. B. Hastings and Frederick B. Flinn. The major work carried on in this connection is presented below.

(a) *Urinary sulphur*.—The rate of secretion of oxidized sulphur in men subjected to heat exposure during working periods was determined and found to be greater than that for men doing similar work without exposure to heat.

(b) *Alkaline reserve of the blood*.—It was noted that the decrease in the alkaline reserve in the blood of dogs subjected to heat plus work was greater than that produced by the same amount of work without exposure to heat.

(c) *Blood sugar*.—The fall in blood sugar was greater when heat was present than when work was the only factor.

(d) *Organic acids and phosphates in the urine*.—The data thus far obtained on these constituents of the urine are insufficient to permit drawing of conclusions at this time.

(e) *Creatine*.—It was found that the creatine secretion increased during the period of work and exposure to heat.

It appears thus far that the changes in the organism denoting fatigue may be hastened if excessive heat exposure accompanies muscular activity.

III. INVESTIGATION OF WORKING AND SANITARY CONDITIONS OBTAINING IN GOVERNMENT BUILDINGS.

In compliance with a request of the Post Office Department, an officer was detailed to investigate into the sanitary conditions obtaining in Federal post-office buildings and in postal stations leased by the Government in the cities of New York, Philadelphia, Boston, Chicago, Detroit, and Brooklyn. A total of 133 postal stations were investigated, viz, 32 in New York, 31 in Brooklyn, 22 in Boston, 12 in Detroit, 18 in Chicago, and 18 in Philadelphia. The entire survey was completed and reports rendered on each station.

An investigation was conducted into an alleged health hazard existing in the stamping and boxing section of the Interest Coupon Division, Register's Office, Treasury Department, as a result of fumes from a mixture used on the stamping machines. Analysis of the process was made and the working conditions thoroughly investigated, due consideration being given to sickness and absenteeism, medical supervision, and dispensary records. The subject of ventilation was given careful consideration. Laboratory experiments were conducted with a view of finding a more suitable substance than gasoline for use on the stamping machines. The objectionable condition was removed after a suitable mixture had been found and the ventilation and illumination of the workroom corrected.

At the request of the Post Office Department a survey of sanitary conditions obtaining in the central post-office station, Washington, D. C., was made for the purpose of determining whether or not conditions existed which might affect the health of the employees. Visits were made at various times for the purpose of observing the working conditions; and sanitation, personal service facilities, illumination, and air condition were given careful consideration. Air samples were taken with a view to determining carbon dioxide content and dust. Proper recommendations were made with respect

to ventilation, drinking facilities, illumination, and heating arrangements.

A survey was made of conditions obtaining in the income tax unit of the Internal Revenue Bureau, with regard to illumination and glare. Over 100 cases complaining of eyestrain and headache were given examination. The scope of the survey included: (1) Degree of brightness from white walls of the wings of the building; (2) illuminometer measurements over the working plane in the room at various distances from the windows; (3) control of glare by simple mechanical means; and (4) illuminometer measurements on the working plane with such control measures in use.

A sanitary survey was conducted of the mail-equipment shops, Washington, D. C., with result that unsanitary conditions were corrected and proper exhaust was placed on a large planing machine, the fume hazard in the tinning room corrected, rest period inaugurated, and a rest room with proper facilities provided for.

In compliance with a request from the Department of Justice relative to an existing health hazard in the basement of the building, various inspections were made at different times and recommendations made to the Department of Justice.

IV. CONSULTING SERVICE.

Numerous requests for assistance were received from industrial plants, industrial workers, and from various State and municipal health authorities and governmental agencies on dusts, abnormal temperature and humidity, industrial poisons, fumes, gases, cutting oil dermatoses, and occupational diseases. In addition, advice and recommendations were given in compliance with requests for assistance in diversified problems, such as effect on the health of workers of trinitrotoluol; sulphuric acid in paper compounds; wool dust in blanket manufacturing; acetanilid, lens grinding; ether and alcohol fumes; ammonia gas and liquid; pickling acids and compounds; also information in regard to carbon monoxide poisoning; acetylene poisoning; air pollution from open-hearth furnaces; proper footwear in wet processes; gases from salamanders; eyestrain among employees; dermatosis caused by electric welding; grain itch; nickel itch; dermatic infections in the case of paraffine workers; quantitative toxicity of air fuel oil vapor mixtures; health hazards in the manufacturing of rubber tires; modern heating and ventilating systems and regulation of atmospheric conditions; dust in the abrasive industry relative to automobile factories where precision grinding processes are involved; dermatitis among workers using a certain rubber cement, and among workers handling picric acid, arsenical and nickel compounds and fulminate of silver; health hazards in the manufacture of cigars and pipe tobacco; industrial wastes; infection among brass workers; fatigue; dangers to workmen coming in contact with wood glue containing bichloride of mercury; standard forms for routine sanitary inspection and various other industrial problems in which the health of workers was concerned, and to encourage installation of appropriate medical supervision by means of services of industrial physicians possessing qualifications to cope with the various problems arising within the scope of industrial hygiene.

V. SUPERVISION OF MEDICAL AND SURGICAL RELIEF WORK.

The medical and surgical relief work in connection with care and treatment of injured civil employees, in conformity with the provisions of the Federal compensation act of September 7, 1916, conducted at the request of the United States Employees' Compensation Commission, was continued at the Curtis Bay general ordnance depot, South Baltimore, Md.; Muscle Shoals area, Muscle Shoals, Ala.; comprising United States nitrate plants Nos. 1 and 2, and the construction of the Wilson Dam; Morgan general ordnance depot, South Amboy, N. J.; Rock Island Arsenal, Rock Island, Ill.; Army supply base, Brooklyn, N. Y.; general supply depot, Jeffersonville, Ind.; Army reserve depot, New Cumberland, Pa.; Savanna proving ground station, Savanna, Ill.; and general supply depot, Atlanta, Ga. This service was discontinued at the Old Hickory powder plant, Jacksonville, Tenn., on December 31, 1920; at Amatol shell-loading plant, Hammonton, N. J., on September 18, 1920; and at the general ordnance depot, Fort Wingate, N. Mex., on November 15, 1920.

In some of the areas there was imperative need for institution of sanitary measures and precautions relative to removal of breeding places for mosquitoes, efficient removal of waste products, and removal of latrines. Sanitary inspections were made of barber shops, restaurants, and other places located on the reservation and in the industrial village. Necessary measures were installed to effect reduction in frequency and severity of accidents. Due consideration was given to control of occupational health hazards by constant attention to hazardous operations. Other problems encountered were the removal of fumes from a spraying machine used in spraying containers for shells, and also in the soldering processes, by the installation of proper exhaust fans; control of an epidemic of furunculosis developed among the workers following the adoption of a labor-saving device, by eliminating the hazard and at the same time increasing the output in the operation; ventilation of warehouses and the control of dust; wearing of suitable clothing and footwear in certain processes; the installation of safety appliances on machines and conveyors; precaution in the handling of picric acid and trinitrotoluol; the installation of safety guards on elevators, and the institution of necessary quarantine measures against diphtheria and scarlet fever.

The supervision of medical and surgical relief work was discontinued by the Industrial Hygiene Office April 20, 1921, when this work was turned over to the Hospital Division of the service.

VI. MISCELLANEOUS.

A. LABORATORY ACTIVITIES.

Samples collected during the course of industrial hygiene surveys of industrial plants have been analyzed from time to time by Asst. Chemist Harry W. Houghton at the Hygienic Laboratory. The United States Bureau of Standards has rendered assistance in the chemical analysis of cutting oils and compounds in connection with research work on industrial dermatosis, the bacteriological tests

being conducted at the Hygienic Laboratory. Assistance has been rendered by the laboratory of the College of Physicians and Surgeons, Columbia University, in connection with the studies in the chemical aspect of industrial fatigue, and by the laboratory of the department of public health, Yale University, New Haven, Conn., in air conditioning and dust studies.

B. COOPERATION WITH UNITED STATES BUREAU OF MINES.

The cooperative arrangement with the United States Bureau of Mines whereby Passed Asst. Surg. R. R. Sayers was detailed upon request to serve as chief surgeon to that bureau, was continued throughout the entire year. Various research activities were carried on both in the field and at the Pittsburgh experimental station of the Bureau of Mines. Among the problems undertaken were: Surveys of mining camps in the States of Illinois, Kentucky, California, Arizona, and Utah into sanitary conditions, specific recommendation being made; investigation into methods of collecting and preserving blood from persons affected or overcome by carbon monoxide for transportation incident to analyzation; research work in connection with analysis of carbon monoxide in the blood; research work on dogs in connection with carbon dioxide and oxygen mixture for resuscitation of persons overcome by carbon monoxide with respect to the feasibility of use of this method by first-aid men; selection of analysts for color work in blood chemistry; solubility of carbon monoxide in serum and plasma; physiological effects of high temperatures and humidities;⁴ physiological effects of ventilation; lead poisoning in the mines of Utah; study of medical organizations of the mining communities of the Lake Superior district; standardization of first-aid method with result that a revised manual for use in mining and allied industries is being prepared, and will be ready for distribution about September 1, 1921; preparation of a report on observation of caisson illness occurring during the construction of the public-service commission tubes under the East River, N. Y., which will soon be published as a technical paper; and the preparation by Passed Asst. Surg. R. C. Williams, of the United States Public Health Service, of the Miners' Safety and Health Almanac for the calendar year 1921, approximately 200,000 copies of which have been distributed to miners throughout the country.

INDUSTRIAL SANITATION.

In October, 1920, upon request of the American engineering standards committee, the service agreed to act as sponsor of an Industrial Sanitation Code. A sectional committee was organized in accordance with the rules of procedure of that committee and State industrial bureaus and private organizations interested in the welfare of industrial workers were invited to designate representatives to serve on the committee and cooperate in the drafting of the code.

Service officers have been detailed to sectional committees, at the request of the respective sponsors, to assist in the formulation of the

⁴A Preliminary Study of the Physiological Effects of High Temperatures and Humidities in Metal Mines. Public Health Reports, Jan. 28, 1921.

following codes: Safety Code for use of Grinding Wheels; Industrial Lighting Code; Gas Safety Code; Safety Code for Machine Tools; and the National Safety Code for the Protection of the Heads and Eyes of Industrial Workers.

PUBLIC HEALTH ADMINISTRATION.

SANITARY SURVEY, SHREVEPORT, LA.

From February 11 to March 9, 1921, a sanitary survey of Shreveport, La., was conducted by Scientific Asst. Harry S. Lucas in co-operation with the State and local health authorities, for the purpose of outlining a sanitary system for districts in the city outside of the city sewer and water service. As a result of the survey it was found that the system of surface toilets and garbage disposal was totally inadequate and such as to prove a menace to the health of the city. Specific recommendations were made which, if adopted, would lead to the eradication of these sources of infection, and the establishment of an adequate and satisfactory system of disposal of city wastes in Shreveport.

DETAILS TO STATES AND CITIES.

Upon the request of the governor of New Mexico that a service officer be detailed to act as State health commissioner of New Mexico, Passed Asst. Surg. C. E. Waller has served in that capacity since July, 1919.

Associate Sanitary Engineer (R) Leslie B. Frank continued to serve as city health officer in Dallas, Tex., until June 1, 1921, conducting a study of intensive health administration.

PUBLIC HEALTH ADMINISTRATION IN ARIZONA.

At the invitation of the governor of the State of Arizona, a study of the public health organization and activities in the State was conducted by Asst. Surg. R. C. Williams, extending from December 20, 1920, to March 28, 1921.

The survey included an investigation of the powers and duties of the State health organization and the method of appointment of the members.

Special investigations of public health administration were made in Phoenix, Tucson, Douglas, and Bisbee.

Following are some of the recommendations made by Dr. Williams: That the State health commissioner be a full-time officer appointed by the State board of health; that the State board of health consist of the State health commissioner, ex-officio, and three members, at least one of whom shall be a physician; that the regulations promulgated by the State board of health be given the force and effect of law; that there be appointed a sanitary engineer, a bacteriologist, a public health nurse, and two inspectors, all to give their entire time to the work; that the State health department be authorized to exercise sanitary supervision over the production, handling, storing, and distributing of all milk offered for sale; that the present State laboratory located at Tucson be expanded into a State diagnostic

laboratory and be made an integral part of the State health department under the supervision and direction of the State health commissioner, and that it perform bacteriological examinations of water and milk supplies, sewage and waste disposal, and examinations of diagnostic specimens to assist physicians of the State in the diagnosis and control of communicable diseases; that the collection and compilation of vital statistics be done by a chief statistician, and that energetic efforts be made to secure the notification of reportable diseases and complete registration of births and deaths. An estimate was submitted of the amount that would be needed to support these suggested activities of the State health department.

MODEL VILLAGE, PERRYVILLE, MD.

Under the direction of Passed Asst. Surg. J. G. Wilson a number of observations, for nearly two years, have been made in connection with a model village which the service has formed at Perryville, Md., on a reservation of 516 acres which was transferred to it by Congress after the war. The reservation now has a population of approximately 840 persons, and is well adapted for research work. The buildings include 200 cottages, two general stores, a model school house, club, firehouse, and theater. Communicable diseases, diphtheria in particular, have been kept down to a low rate of prevalence by means of prompt isolation, laboratory analysis and chlorinated water, school medical supervision, and good living conditions. The birth rate on the reservation was 39.33 per 1,000, as against 24.39 in the whole State and 28.78 in the county. The death rate was only 3.67, an excess of children being roughly balanced by the small number of aged persons. A physical examination of the children showed that 93.5 per cent had physical defects of teeth, tonsils, adenoids, eyes, or hearing, this large percentage probably being due to the lack of facilities for remedial correction nearer than Baltimore. Between November, 1919, and November, 1920, the percentage of underweight children was reduced from 42.7 to 13.8. Mosquitoes have been practically exterminated on the reservation.

COOPERATION WITH COMMITTEE ON MUNICIPAL HEALTH DEPARTMENT PRACTICE OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

During the past year, in cooperation with the committee on municipal health department practice of the American Public Health Association, and the health officers of the respective cities, surveys were conducted by certain designated service officers of the organization and activities of the health departments of the following-named cities:

Surg. L. R. Thompson: Duluth, Minn.; St. Paul, Minn.; Fort Worth, Tex.; Omaha, Nebr.; Houston, Tex.; Des Moines, Iowa; Chicago, Ill.; Milwaukee, Wis.; Kansas City, Mo.; Kansas City, Kans.; St. Louis, Mo.; Oklahoma City, Okla.; Dallas, Tex.; Salt Lake City, Utah; Denver, Colo.; San Antonio, Tex.

Acting Asst. Surg. C. C. Applewhite: Atlanta, Ga.; Jacksonville, Fla.; Savannah, Ga.

Acting Asst. Surg. W. K. Sharp: Birmingham, Ala.

Passed Asst. Surg. C. L. Williams: New Orleans, La.

Associate Sanitary Engineer R. E. Tarbett: Louisville, Ky.; Indianapolis, Ind.

Asst. Surg. Charles Armstrong: Cincinnati, Ohio.

Associate Sanitary Engineer A. W. Fuchs: Nashville and Memphis, Tenn.

COOPERATION WITH JOHNS HOPKINS UNIVERSITY.

Surg. W. H. Frost continued in charge of the department of epidemiology in the Johns Hopkins School of Hygiene and Public Health to which he was detailed by the service in response to the request of the Johns Hopkins University authorities. Dr. Frost also continued in general charge of the stream pollution studies and of the epidemiological influenza investigations being made by the service.

COOPERATION WITH INDIAN SERVICE.

Examinations of specimens and tests of a bacteriological nature to aid in the diagnosis of communicable diseases have been made at the service laboratories for physicians of the Indian Service.

COOPERATION WITH HAWAIIAN AUTHORITIES.

The service has cooperated with the Territorial board of health of Hawaii in the examination and medical and surgical care of patients in isolation at Kalihi.

COOPERATION WITH PORTO RICAN AUTHORITIES.

Cooperation with Porto Rican authorities was continued, the chief quarantine officer for Porto Rico being detailed for duty with the Institute of Tropical Medicine and Hygiene of Porto Rico.

CHILD HYGIENE.

Under the direction of Surg. Taliaferro Clark, during the fiscal year 1921, the studies and investigations in child hygiene which were begun the preceding year in 6 States and the District of Columbia were continued. In addition to these, important studies were carried on in 4 other States, making a total of 10 States and the District of Columbia in which child hygiene activities were conducted in cooperation with the local authorities. The child hygiene section, through its headquarters staff, also cooperated with the section of public health education, both in the preparation of newspaper material and in the handling of correspondence relating to the health problems of women and children.

THE VALUE OF MILK POWDER IN INFANT FEEDING.

This investigation in Boston of the value of dried milk powder in infant feeding was begun in August, 1919, and was conducted in cooperation with the Boston Baby Hygiene Association, the Boston health department, and several other agencies in that city.

Sixty-two babies in group I were fed on grade A natural milk; 178 in group II, on whole milk powder; and 47 in group III on skimmed-milk powder, plus fresh butter. The results published up to the end of the last fiscal year indicated that dried-milk powder is a safe and useful food for infants, and that it has some points of advantage in the case of babies who do not digest natural milk

well. It was shown that the control infants in group I made an average gain in weight less than that of the babies in groups II and III, who were fed on dried-milk products.

The investigation was continued through the summer of 1920, and the following results are based on studies of 241 infants who were enrolled for the experiment at some time between August, 1919, and October, 1920, and who were on experimental diets long enough to make their records of value. Of these, 63 were in the control group (group I), 138 in group II, and 40 in group III. Each feeding group was studied in three age groups—all ages, 1 to 3 months, inclusive, and 4 to 6 months, inclusive. At the conclusion of the study, as was indicated by the preliminary report, it was shown that the infants fed on a modification of cow's milk (group I) fell distinctly below those fed on a modification made from whole milk powder. This difference was especially marked in the younger children (1 to 3 months), but there was a distinct difference in all three age groups.

The group fed on a modification reconstructed from unsalted butter and skimmed-milk powder (group III) increased less rapidly in weight in the older group (4 to 6 months, inclusive) and in the total group (all ages), but in the younger group (1 to 3 months, inclusive) the growth kept up with the group on whole milk powder (group II) for about 11 weeks. After the twelfth week on the diet, the rate of growth decreased and the curve approaches that of group I. However, it should be remembered that the number of infants in the subage groups of group III are small, as is also the 4 to 6 months class of group I.

Since the weight curves for group I are below those for group II in all three age classes, it seems safe to definitely conclude that the infants on whole milk powder gained in weight more rapidly than those on cow's milk. Group III fluctuates in the various age groups, and, therefore, no definite conclusions can be drawn in regard to the skimmed-milk powder.

Bacterial investigations of intestinal flora.—This study was based on 110 specimens of infants' stools, received from 24 babies through a period of 10 weeks, the average number of specimens from the same baby being 4.6. Specimens from two breast-fed babies were also obtained. A study of the total count of the microorganisms in the group shows the lowest count for the breast-fed babies, with group II (whole milk powder) second.

	Per mg.
Breast fed	324, 000
Group II (whole-milk powder)	980, 000
Group I (grade A milk)	1, 130, 000
Group III (emulsified skimmed-milk powder)	1, 140, 000

The babies fed a milk prepared in the home under reasonable precautions apparently had greater chances of escaping digestive disturbances during hot weather than those receiving a dairy-handled product. The bacterial count of the several milks used showed: Whole-milk powder, 1,600 per c. c. when made up; skimmed-milk powder, 27,000; unsalted butter, 1,900,000; grade A milk (on hot days), 200,000; emulsified milk, 100,000.

The absence of viable tubercle bacilli in the milk powder was demonstrated by experiments on guinea pigs and rabbits. The addi-

tion of lactose has little effect on the bacteriological content of the various milks. "Holding" the milk, either with or without the addition of lactose, markedly increases the number of bacteria.

The continuation of this investigation confirmed the conclusions of the preliminary report that the dried-milk powders and their remade products used in the study are safe for infant feeding, and in some cases seem to have distinct therapeutic value.

THE OREGON SURVEY OF MENTAL DEFECT, DELINQUENCY, AND DEPENDENCY.

During the first half of the fiscal year, a survey of mental defect, delinquency, and dependency in Oregon, begun at the request of the State legislature and conducted by the University of Oregon, was completed under the direction of Acting Asst. Surg. Chester L. Carlisle of the service.

Without funds for a paid staff and confronted by the task of adequately covering 96,699 square miles of territory, containing 36 counties, some of which are about the size of Connecticut, the director of the survey conceived the plan of enlisting the aid of every public-spirited citizen in the State as a volunteer assistant. These included physicians, judges, lawyers, clergymen, nurses, educators, State, county, city, and village officials, officers and members of all social welfare and philanthropic agencies, and every individual citizen known to be interested in community welfare work.

These volunteer assistants sent in reports of cases of mental or physical defects, delinquency, dependency, or retardation in school which came under their observation. In addition, the survey was further assisted by voluntary contributions of time and labor by a number of especially trained observers.

This survey was remarkable in being the first State-wide cooperative citizen survey in the field of mental, physical, and social hygiene in the history of the world. The report of this work affirmatively answers the question as to whether the American people can undertake such a project and carry it to success.

Of 1,925 children handled by the court of domestic relation 79 per cent showed mental dulling or mental defect, and 40 per cent of these showed actual mental defect. Of 123 inmates of the Oregon State Penitentiary mental dulling or mental defect was found to be present in over half the number.

Of 55 girls in the Oregon State Industrial School for Girls 24.2 per cent showed definite mental defect.

Of 146 boys in the Oregon State Training School 79.4 per cent showed a mental dulling or mental defect, and 24.6 per cent showed actual mental defect.

Of 451 inmates of the poor farms 175 showed some mental defect, disease, or disorder.

Of 33 blind children 2 showed mental defect.

Of 93 deaf children examined 13 showed mental defect.

In one of the cities of Oregon, among 258 over age for grade children in the elementary schools, the basic causes of retardation were shown to be mental defect and dullness, 31 per cent; diseases and physical defects, 30 per cent; poor heredity and improper home conditions, 20 per cent; economic and other causes, 19 per cent.

There were at the time of the survey (or just previous) 9,874 individuals in State or private institutions receiving public funds. Of these, 3,859 were insane, 656 mentally defective, 2,834 delinquents, and 2,525 dependents (exclusive of those on poor farms). When to these numbers are added those individuals in the community and on poor farms we have 3,994 insane, 1,733 mental defectives, 30,141 delinquents, and 29,555 wholly or partially dependent.

In a school enrollment of approximately 32,480 pupils (22 per cent of all the school children in the State) 9,742 children were over age for their school grade, and therefore retarded in their school progress. Among these retarded pupils were 520 children who appeared to need medical or surgical attention to overcome some particular handicap to successful school work, and were therefore entitled to relief under the crippled children's law of Oregon.

Excluding known cases of insanity and known cases of gross mental defect and one-half of the delinquents as petty offenders and one-half of the dependents as being probably remedial cases, there were still left 29,847 individuals as actual social liabilities. These represent almost 4 per cent of the whole population of the State.

Suggestions were made by the service officer conducting the survey as to the measures best adapted to remedy these conditions in the interest of the State and the individual.

INVESTIGATIONS IN MENTAL HYGIENE, JUVENILE COURT, DISTRICT OF COLUMBIA.

A commissioned medical officer for full-time duty and an acting assistant surgeon for the physical examination of females served with the juvenile court throughout the greater part of the fiscal year continuing the investigations begun in the early part of 1920.

Complete physical and mental examinations, including the Wasserman tests, were made on each subject unless a part of such examination had already been made.

The results of these examinations were considered in connection with the family and personal history and court record in arriving at an understanding and classification of each individual examined. In each case a brief summary was made, with recommendations, for the use of the court and probation officers in the subsequent handling of the case. Practically all children appearing officially before the court were examined. Therefore, a large number of first-time offenders were examined, an important point from a sociological standpoint.

The total number of children examined during the fiscal year was 684. Of the 49 white females examined mentally, 26 were normal, 3 mentally deficient, 3 retarded, and 17 showed constitutional psychopathic inferiority.

There were 242 white males, the mental examination of whom showed 134 normal, 38 retarded, 23 mentally deficient, and 47 of constitutional psychopathic inferiority.

Among the 300 colored males, 150 were normal, 90 retarded, 28 mentally deficient, 5 epileptic, 2 unclassified, and 25 showed constitutional psychopathic inferiority.

Of 93 colored females, 62 were normal, 19 retarded, 6 mentally deficient, 2 epileptic, and 4 showed constitutional psychopathic inferiority.

The value that may result from medical work in connection with juvenile courts may be summed up as follows:

1. The detection and possible correction of physical defects at a period in life when they are most amenable to treatment.

2. The detection of mental defect, psychopathy, or other deviations from the normal at a period in life when corrective measures are of most value. For those subjects who do not profit by average training adequate preparation can be made for special classes, manual training, or institutional control.

3. It affords medical examination and makes possible treatment for a group of people who probably stand most in the need of such aid.

4. A high type of medical work carried on in connection with a juvenile court is probably of considerable value in the way of public-health educational work in that each year, for a large number of children, it is a practical illustration of what thorough medical examination and treatment consist of.

5. If capably performed it is of value to the court and probation officers in the proper understanding and handling of these children, and at the same time increases the confidence of the probationers and their families in the efforts made in their behalf.

CHILD HYGIENE IN DELAWARE.

The cooperation of the service with the Delaware Reconstruction Commission in the study and investigation of child-hygiene problems was continued throughout the past fiscal year. The service officer in this field served as medical director of the State board of education for the school year 1920-21.

All of the teachers attending the summer school were given physical examinations, a very desirable measure from the standpoint of health work in the schools, not only as a means of ascertaining the physical condition of the teachers, but also because it was found that the teachers who had been examined previously were exceedingly interested and cooperative in having the defects of the children corrected.

In July, 1920, the antituberculosis society made available \$1,800 for the purpose of employing physicians for medical inspection of school children in their own communities. Eighteen physicians were employed, who were also appointed by the State board of education to take charge of the communicable-disease control in the schools to which they were assigned. In consequence, only one school in the entire State was closed for more than a day or two because of communicable diseases. The State board of education adopted several recommendations made by the service officer regarding the control of communicable diseases, with the result that now a school can only be closed upon the authority of the medical inspector. The work in the schools outside the districts covered by the physicians employed for medical inspection was done by the service officer. Six nurses were engaged in school work during the entire school year; 6,489 pupils were examined by both physicians and nurses, and 5,315 were examined by the nurses alone, a total of 11,804. Only the last two months of the year were devoted to follow-up work, and it is of interest to note that of 16,995 defects practically 10 per cent have been already corrected.

In March, 1921, money was made available by the Delaware chapter of the American Red Cross for the purpose of establishing 20 nutrition classes in the schools. These were established in small rural schools, too late to obtain definite statistics of the results; but the work is to be continued during the next school year.

As a result of the demonstration by the United States Public Health Service mouth-hygiene unit during April and May, 1920, the organization of a State dental unit was made possible. This was financed by a public-spirited citizen of the State who gave \$20,000 to cover the work for a period of two years. A dental operator and two dental hygienists were employed, and a Ford truck and portable dental equipment were purchased. This unit performed 2,154 prophylactic treatments, 957 extractions, and 160 fillings. A definite relation was found to exist between the pupil's school standing and his mouth condition. Those children who had an average scholastic standing of under 75 per cent had an average mouth grade of 53 per cent, while those whose average scholastic standing was over 75 per cent had an average mouth grade of 72 per cent.

Various addresses relating to the work in the schools were delivered and articles in regard to it were prepared for publication.

CHILD HYGIENE STUDIES IN MISSOURI.

The child hygiene activities begun in October, 1919, in the State of Missouri were continued throughout the past fiscal year.

During the summer of 1920 efforts were concentrated on the opening of clinics and health centers for expectant mothers, infants, and children of preschool age. Excellent results were obtained in 23 counties. The Red Cross public health nurses in these counties report 3,117 babies enrolled and 2,630 visited; 1,574 preschool children enrolled and 952 visited; and 477 prenatal cases visited.

Highly successful "Baby Weeks" were held at Springfield and in Greene County, the latter taking the form of a traveling clinic. In Springfield a department store gave the use of their entire top floor and fitted it up for an efficient clinic. The personnel consisted of the service staff and specialists among the local medical and dental professions. The total number of infants attending the clinic was 463, and 147 children of preschool age were also in attendance.

The traveling clinic visited 14 rural communities in Greene County. There were 299 children examined and advice given to mothers present; 3,970 pieces of literature were distributed.

In 23 towns, 5,610 homes were visited and valuable data obtained which led to better health supervision of large numbers of infants and children.

One outstanding feature shown by the survey is the large percentage of children breast fed over six months. Lack of breast feeding is not a problem in Missouri. The big problem is the question of milk consumption among children of preschool age. Of 8,000 children under 10 years of age, 6,753 consume less than 1 pint of milk daily.

Of 16,623 children born alive, only 5,099 had the eyes treated, showing serious defects in the matter of eye prophylaxis.

Four nurses were detailed to tour the State and inaugurate and standardize school hygiene work. Requests for examination blanks were received from school authorities of 78 towns in 40 counties. Approximately 114,000 cards were furnished for recording physical examinations.

Nineteen thousand one hundred and seventy-one children were examined in the schools in 34 towns, among whom 29,626 defects were found. Among 14,054 children examined in rural schools in 20 counties, 19,096 defects were found. The defects noted are the common gross defects such as defective vision, hearing, teeth, nasal defects, enlarged tonsils, adenoids, and skin eruptions.

Most of the school hygiene work was carried on by the local medical and dental professions and public health nurses, the Public Health Service making surveys and demonstrations, and standardizing the work in certain selected communities. On request, the service staff supervised the local workers and lent such assistance as was deemed necessary. These activities resulted in a stimulation of the communities for further health work.

At the request of the State board of health, and State board of charities, a survey was made of the girls confined in one of the industrial State institutions. Besides the physical defects discovered, 44 per cent were found to be infected with the gonococcus, and 17.7 per cent showed evidence of syphilitic infection.

In a special survey of the repeaters in the schools of one town, it was found that mouth breathing and malnutrition stood well in the front in defects.

In Johnson County, exhibition clinics were held for the instruction of school-teachers taking the postgraduate course at the State Normal School. These clinics served a double purpose, the children being benefited and the teachers instructed. Nine hundred and fifty teachers attended the demonstration.

Nutrition clinics were held in the schools in a number of communities. Experience has shown that individual clinic work is far superior to class work in nutrition. One particular group of 173 underweight children was under observation for one year. In April, 1920, they were 7 per cent or more under weight. In June, 1920, 57 per cent had gained at more than the normal rate. In October, 1920, 69 per cent had gained at more than the normal rate. In April, 1921, 79 per cent had gained at more than the normal rate. The average gain per child for the period was 4.2 pounds more than the normal rate of gain. These results were obtained by a combination of corrections of both physical defects and dietary errors.

Assistance to expectant and young mothers was given through prenatal letters and personal instruction. At the close of the fiscal year there was an active mailing list of 618 mothers. The medical profession welcomed this instruction from the State.

The idea of community responsibility for the health of the child has been embedded in the minds of all interested leaders, and the investigations and demonstrations in child hygiene by the Public Health Service has had considerable influence on legislative action. In March, 1921, a physical education bill was passed by the State, which included the teaching of health habits, physical examination of school children, and recording of same, and definitely co-

ordinates the department of education and State department of health in their relation to school hygiene. Another important bill was enacted requiring all physicians, midwives, and others to use prophylactic solution in the eyes of the new born.

CHILD HYGIENE INVESTIGATION IN MISSISSIPPI.

In 1920 the State Legislature of Mississippi appropriated \$40,000 for the purpose of establishing a bureau of child welfare with the State board of health. At the request of the State board of health, the Public Health Service detailed a medical officer to the State of Mississippi for the purpose of investigating the needs of the State as related to child hygiene and of organizing the bureau of child welfare of the State board of health.

Within five months after the entrance of the service into the State, 11 counties had made the necessary appropriations for a child-welfare unit.

Five child-welfare units were organized for work in counties that could not make provision for county health units and yet appreciated the need of child-welfare work. Each unit consisted of a woman physician, a Public Health nurse, and a clerk microscopist. Their appreciation and desire for these units was evidenced by a county appropriation of \$1,000 each to assist in financing the work.

In 202 schools, 17,110 children were examined, 11,270 of whom were white and 5,840 colored. Among the white children, 219, or 1.9 per cent, were found to be suffering from trachoma. Of colored children, 96, or 1.6 per cent, had trachoma. Among the white children there were 1,353 cases of hookworm—12 per cent—and 534 cases among the Negroes—9.1 per cent. These diseases were in addition to the usual physical defects.

Through cooperation of local physicians and dentists and by means of health records and nutrition clinics, excellent results in the correction of defects have been obtained. When a child's health record shows that all of his remediable defects have been corrected, he is given a health button.

Of 17,110 children examined, 412 white children and 63 colored received buttons.

Nutrition work is conducted through a director who gives talks to groups of parents and teachers and to children in the schools. A large part of her work consists in holding individual mother-child nutrition conferences.

Eighty-three school buildings were inspected, many of which were insanitary. The State sanitary engineer has agreed to cooperate with the bureau of child hygiene in an effort to bring about more sanitary conditions.

A limited amount of infant, preschool, and prenatal work was done. The prenatal work was chiefly of an educational nature, and a series of prenatal letters was sent to expectant mothers.

The supervision of midwives was conducted by a Public Health nurse, who visited the counties, held classes for the midwives, and investigated their qualifications for registration. No midwife is given a permit to practice until she has been investigated by the super-

vising nurse and recommended by the county health officer. This is expected to gradually raise the standard of midwifery of the State.

CHILD HYGIENE IN GEORGIA.

The work of cooperating with the State Board of Health of Georgia in organizing a division of child hygiene and making State-wide studies and investigations of child-health problems, begun shortly before the close of the fiscal year, was completed during the summer and fall of 1920.

The work included the coordination of the work in child hygiene of various agencies with that of the State board of health, the establishment of child-health centers, the preparation and distribution of child-health literature and exhibits, and related activities.

Publicity work was carried on through the press, conferences, and talks to various clubs and organizations.

When the service began the work in the State 17 counties had full-time health officers. At the end of less than six months, when the State was ready to assume responsibility for the work, there were 19 full-time county health officers and seven additional counties had voted funds for the employment of health officers. Thirteen child-health centers were established in the State. These were conducted by a health officer or nurse, usually by both.

During the month of October 13 fairs were held in the State and child-health centers were conducted at each.

The work in Georgia had the cooperation of the State Pediatric Society, county and city health officers, the southern division of the American Red Cross, Emory University Medical College, the State Agricultural College, the School of Education, the State library commission, the board of public welfare, and the Woman's Club of Atlanta.

MOUTH HYGIENE IN VIRGINIA AND WEST VIRGINIA.

The beginning of the fiscal year 1920-21 found the dental unit in the State of Virginia, where it conducted activities in cooperation with the State educational and health authorities. This work was done in the summer normal schools and the experimental schools connected with them. During this period the normal schools at Charlottesville, Petersburg, Harrisonville, and Farmville were visited. Clinical demonstrations were given at each school, the film "Come Clean" was presented, and lectures were given by both members of the unit.

Tangible evidence of the success of the work done is to be found in the establishment of a permanent clinic at Petersburg.

As a result of activities at Huntington, W. Va., the city department of education established a school clinic with the cooperation of the local dental society. Through the influence of this unit a car was secured for the use of the school nurse.

MOUTH HYGIENE IN TENNESSEE.

Upon completion of the work in Huntington, the unit proceeded to Tennessee to cooperate with the bureau of mouth hygiene of the State department of health.

During the period of work in this State over 6,000 mouth chartings were made and a system of estimating the sepsis of a mouth and expressing it in terms of percentage has been devised. A relation between the septic mouth and scholarship has been demonstrated and the matter of mouth sepsis as a factor in the physical condition of underweight children has been considered.

A dental clinic was held at all places where more than one day was spent. These demonstrations were attended by local medical and dental men who brought patients to the clinic for the purpose of consultation.

Toothbrush drills were held, and apt pupils were trained as squad leaders for their own grades. In one county questions in mouth hygiene became a part of the final examinations for promotion.

Organized programs were given at Johnson City, Greenville, Morristown, Knoxville, Marysville, Cleveland, Chattanooga, Columbia, Mount Pleasant, Nashville, Jackson, Memphis, Murfreesboro, Bristol, Kingsport, Clarkesville, and Lebanon. In addition a limited amount of work was done at Franklin, Soddy, Tyner, Sales Creek, and Ooltewah.

As a result of the work the following communities have school clinics already in operation or have taken definite steps to assure their being in operation at the opening of the year: Johnson City, Greenville, Morristown, Knoxville, Chattanooga, Memphis, Bristol, Kingsport, Clarkesville, Columbia, and Mount Pleasant.

Two hundred and sixty-five lectures and addresses have been given, and five papers on dental subjects have been prepared.

STUDIES OF MALNUTRITION OF SCHOOL CHILDREN, BALTIMORE, MD.

During the latter part of the last fiscal year, 200 underweight children in Baltimore, all having one or more physical defects, were selected as a group for the study of the effect of the correction of physical defects on growth and development. The defects corrected included defective teeth, enlarged or diseased tonsils, adenoids, defects of hearing and vision, hernia, bronchitis, and phimosis.

Of these 200 cases, 153 children have had all reported defects corrected, 11 have had one or more corrections made, 17 refused correction, and 19 left school before any corrections were made. To secure these results 255 visits were made to the two schools, 518 visits were made to homes, 410 visits to clinics and hospitals, 21 visits to welfare agencies, and 6 visits to physicians. An interesting phase of the study were the ramifications developed at points of contact with the community. This resulted in the correction of 67 defects in children outside the group studied, and in the treatment of two teachers, four mothers, and one father.

The children in the group were weighed at frequent intervals. It was found that with only one exception every girl, after the correction of her physical defects, gained at a more rapid rate than the normal average. This was also true of the boys from 8 to 12 years.

Though the number of children studied is too small to make these results conclusive, they are highly suggestive. This investigation furnishes an important link in the evidence pointing to the hamper-

ing effect of physical defects on growth and development and the benefits to be gained by their correction in childhood.

DISTRICT OF COLUMBIA.

A work begun by the service just at the close of the fiscal year was the physical examination of the Girl Scouts of the District of Columbia preparatory to their going into camp on the reservation of the Edgewood Arsenal.

A SURVEY OF SCHOOL HEALTH SUPERVISION IN MINNEAPOLIS, MINN.

On request of the director of the department of hygiene of the board of education, who is also the city health commissioner, a very comprehensive survey of school health supervision in Minneapolis was made by the chief of the child hygiene section.

The subjects of medical inspection, school nursing, special classes for the deaf, blind, crippled, mentally subnormal children, and those with defective speech, sight-saving classes, school clinics, nutrition work, open-air schools, physical training, school records, and health education were all covered in the survey, and recommendations were made looking toward the promotion of the highest efficiency along these lines. An outline of suggested topics for health instruction was included in the report.

STUDIES IN MONTANA.

On request of an officer of the State department of health of Montana a service representative was detailed to attend a meeting of the Montana State Teachers' Association, and while in the State to investigate the child-welfare work being conducted in Montana. A study of this work was made, conferences were held with the State health officers, and recommendations were offered looking toward a better organization of child-hygiene activities.

For the purpose of comparison with standard tables to determine approximate amount of underweight so that nutrition clinics might be organized, measurements were taken of about 600 pupils in the Central School of Helena.

For the purpose of making a beginning in studies to determine standards of height and weight more accurate and comparable than those now in use, measurements were taken of 188 children in grades 1 to 8. From this number were eliminated those with any gross physical defects, since it is desired to obtain standards for normal children.

COOPERATION IN PUBLIC-HEALTH EDUCATION.

The Child Hygiene Section has cooperated with the Section of Public Health Education throughout the whole fiscal year. Fifteen articles for newspaper publication were prepared in the Child Hygiene Office. Seventeen hundred replies have been sent to letters of inquiry from every State in the Union, most of which have been inspired by the publicity work of the service. With the exception of between 4 and 5 per cent of these letters, which have been requests for literature alone, the inquiries have related to the particular problems of the individual.

SURVEY OF MENTAL CONDITION OF CHILDREN IN FOSTER HOMES IN
DELAWARE.

In July and August, 1920, in cooperation with the children's bureau of the State of Delaware, examinations were made under the direction of Surg. L. O. Weldon to determine the mental status of 52 children who were being cared for in foster homes in the State.

While a remarkably high percentage of those examined were found to be mentally defective, this statement must be taken with reservation because the children examined are the culls from a total of 300 children reported as cared for in foster homes in the State.

Of the total number of children examined 48.7 per cent were feeble-minded and 32.69 per cent retarded.

Of the 300 children reported cared for in foster homes the percentage of feeble-minded and retarded children as represented by these examinations is 8.33 per cent and 3.66 per cent, respectively.

CHILD HYGIENE SURVEY IN HAMPTON, VA.

During November, 1920, Acting Asst. Surg. A. Blanche Sterling made an investigation of the public-health situation with reference to child hygiene in Hampton, Va. Special attention was paid to encouraging the establishment of health centers, the provision of an adequate number of visiting nurses, the medical inspection of schools, also infant and maternity and tuberculosis work.

NEUROPSYCHIATRIC RESEARCHES.

During the fiscal year ending June 30, 1921, this service has conducted certain researches in clinical neuro-surgery. The work has been conducted by Dr. Arthur A. McGugan, at United States Public Health Service hospitals, No. 38 and No. 61, New York City.

The material for such studies was obtained from routine admissions and include 92 neuro-surgical operations. Of this number 17 were classed as head surgery, 1 as spinal, and 74 as peripheral nerve procedures. In addition to this surgical material 624 consultations were held at the two hospitals. In the case of peripheral nerve surgery it is still too early to venture an opinion as to the outcome of end to end anastomosis. However, in all cases of neurolysis there have been most encouraging results.

A new operation for the prevention and cure of painful neuroma has been devised and made the subject of a special report. In addition to the above-mentioned operative procedure certain other new procedures have been developed and are being made the subject of special reports. These reports cover the following procedures:

1. The outer table flap in brain surgery.
2. Implantation of nerve into muscle.
3. Procedure in end to end sutures of peripheral nerve.
4. Procedure in external and internal neurolysis.
5. General directions as to procedure in peripheral nerve lesions where neither neurolysis nor end to end sutures are applicable.

COOPERATIVE RURAL HEALTH WORK.

The work of the service in cooperative rural health demonstrations during the fiscal year continued to be under the direction of Surg. L. L. Lumsden. The results of the cooperative rural health work of the service in the fiscal year ending June 30, 1921, gave further support to the conclusion⁵ presented in the report of this activity for the fiscal year 1920.

The estimate of appropriation approved by the Bureau of the Public Health Service and the Treasury Department and submitted in the sundry civil bill to Congress "for special studies of and demonstration work in rural sanitation" in the fiscal year 1921 was \$500,000. Congress granted \$50,000. In view of (1) the definitely determined⁶ need of sanitary improvements in our rural districts, (2) the lack of local health service approaching adequacy in our rural counties and towns generally, (3) the vital importance from local, State, and National standpoints of having promoted the interests of our food-producing rural sections, (4) the interrelation of rural to urban health, and (5) the demonstrated effectiveness of the plan of rural sanitation work of the Public Health Service to stimulate the development and maintenance of well-balanced, economical local health service, it seemed unfortunate that the appropriation made available was less than 10 per cent of the amount necessary to enable the Federal Government to accept opportunities which were presented at the beginning of the fiscal year through offers from State and local authorities to enter into cooperation in due and reasonable proportion to develop demonstration projects in rural health work. Had the amount estimated for, viz, \$500,000, been made available the demonstration work could have been carried out on a sufficient scale to make a definite impression upon the general situation and the eventual results in the promotion of rural health work with the having of lives and the prevention of costly sickness among the people of the United States would have been more than tenfold of those which were obtainable from the small investment made possible by the appropriation granted.

On July 1, 1920, \$997.42 unexpended under previous contracts remained available. This amount, with the \$50,000 appropriated, made \$50,997.42 available for the cooperative rural health work of the Public Health Service in the fiscal year 1921. Of this sum \$31,460.82 was expended under allotments for cooperative projects in counties and \$5,874.45 was expended for administration, supervision of projects, and studies of the problem of rural sanitation.

During the fiscal year cooperative projects were carried out in 38 counties in 15 States. The total expenditures for the support of the local projects was \$292,063.59. Of this sum \$217,768.39 was provided from municipal, county, and State governmental sources, \$42,834.38 from civic sources, such as local health associations, Red Cross chapters, and the International Health Board, and \$31,460.82 from the rural sanitation funds of the Public Health Service. Thus the investment of Federal funds was covered with odds of over eight to one

⁵ Page 15, Reprint No. 615 from Public Health Reports of Oct. 1, 1920.

⁶ Public Health Bulletin No. 94, pp. 39-44.

for the support of the work. The proportion of the expenses met with funds from local sources is significant. It gives some idea of the stimulating effect of the Federal cooperation and suggests what might be accomplished in this vitally important national field if Congress would grant sufficient appropriations to enable the Federal Government to go into the cooperative rural health business on a reasonably adequate scale.

The amounts of money expended from the different sources for the support of the projects and the scope and the results of the work are presented in the following tabular statement:

Completion of data, by counties, on cooperative demonstration work in rural sanitation in the fiscal year 1921.

Counties (or districts)	Arlington, Va.	Cape Cod health district, Mass.	Cascade, Mont.	Chaves, N. Mex.	Cherokee, Kans.	Clarke, Ga.	Cumber- land, N. C.	Dubuque, Iowa.	Edge- combe, N. C.	Eighth sanitary district of Vermont.
Period of work in fiscal year 1921.....	July 1, 1920, to June 30, 1921.	May 1 to June 30, 1921.	Aug. 16, 1920, to June 30, 1921.	June 1 to 30, 1921.	July 1, 1920, to June 30, 1921.	Dec. 1, 1920, to June 30, 1921.	July 1, 1920, to June 30, 1921.	May 1 to June 30, 1921.	July 1, 1920, to June 30, 1921.	Aug. 1, 1920, to June 30, 1921.
Expenditures:										
(a) Rural sanitation fund (P. H. S.).....	\$300.00	\$312.50	\$3,500.39	\$150.00	\$909.31	\$1,258.29	\$963.29	\$50.00	\$962.46	\$2,310.00
(b) State.....	1,793.24	.....	8,154.44	420.46	6,142.16	3,375.45	898.98	.....	1,582.72	3,269.64
(c) County.....	10,483.00	669.67	8,154.44	.....	.....	570.99	6,626.13	1,294.84	1,850.46	.....
(d) Municipalities.....	.....	.....	2,400.00	325.00	1,200.00	748.50	1,000.01	1,505.84	.....	.....
(e) Other agencies.....	928.00	.....	.....	.....	.....	.....	.....	.....	800.00	.....
Total.....	13,504.24	982.17	22,209.27	895.46	8,251.97	5,884.23	9,589.41	2,850.68	5,195.64	5,579.64
Number of lectures.....	26	39	.....	5	150	112	94	9	66	45
Attendance at lectures.....	1,285	1,422	.....	290	9,918	5,230	6,640	799	3,727	1,730
Pieces of literature distributed.....	6,717	28,944	.....	63	9,262	792	10,410	.....	2,975	4,382
Sanitary inspections:										
(1) Private homes.....	2,420	3	93	868	1,316	4,307	4,012	616	3,376	25
(2) Schools.....	109	1	1	.....	158	118	73	51	28	182
(3) Churches.....	94	6	6	.....	.....	3	.....	.....	.....	.....
(4) Stores, markets, etc.....	414	565	.....	.....	530	47	2,161	510	1,060	257
Total.....	3,037	9	665	868	2,004	4,475	6,246	1,177	4,464	464
Special inspections:										
Food-product places.....	.....	.....	.....	.....	633	1	1,550	262	862	168
Physical examination of school children:	212	302	110	75	.....	.....	.....	.....	.....	.....
(1) Number examined.....	.....	90	1,404	.....	6,901	1,380	1,272	1,903	664	5,199
(2) Number found defective.....	.....	78	1,082	.....	4,622	1,133	763	836	258	4,353
Number treatments induced for correction of physical defects in school children.....	.....	.....	.....	10	56	.....	.....	63	.....	242
Public health nursing:										
(1) Number of visits to cases communicable dis- ease.....	.....	.....	735	291	37	.....	1,848	.....	573	24
(2) Number of talks given to groups of persons.....	147	.....	43	2	40	.....	75	81	142	337
(3) Number of visits to give prenatal care.....	98	.....	24	2	75	.....	572	35	167	12
(4) Number of visits to explain and demonstrate infant hygiene.....	.....	.....	697	100	174	.....	823	295	1,057	60

Laboratory examinations:											
Positive.....	312	2	151	142	43	200	152	131	266		
Negative.....	1,789	100	773	91	42	586	303	197	2,864		
Total.....	2,101	102	924	233	85	786	455	328	3,130		
Immunization:											
(1) Number of complete antityphoid inoculations.....	3		32	2,189	266	737		2,339			
(2) Number of complete antismallpox inoculations.....	73		461		1,618	2,401		2,670			
(3) Number of complete antipneumonia inoculations.....	8										
Antimalaria work.....	(1)	(1)	(1)	(1)	(1)	(2)	(1)	(2)			
Number of persons treated for removal of hookworm infection.....											
Veneral disease prevention.....	58					23		12			75
(1) Number of prophylactic treatments.....			215			1,652	77				
(2) Number of curative treatments.....											
Number of visits by health officer or his assistant.....											
(1) To diagnose suspected cases infectious disease.....	49		1,758	45	22	210	52	36	47		
(2) To impose quarantine measures.....	372		2,348	13	36	504	63	577	18		
Number of cases quarantined.....	454	67	2,261	307	44	602	60	635	186		
Sanitary privies installed:											
L. R. S.....											
Concrete vaults.....				7	28	90					
Bucket and box.....	719			165		72	1		11		
Pits.....				59	400	17		39			
Total.....	719			643	53	330		502	11		
Septic tanks installed:											
Number of privies repaired so as again to be of sanitary construction.....	89			874	481	529	1	561	22		
Number of new sewer connections.....						18					
Number of new water connections.....			155	366		35	44	18			
Number of wells improved.....			92	189	20	15	67				
Number of springs improved.....	51		83	189	42	12	54				
Number of public milk supplies radically improved.....				103		6	4				
Number of life-extension examinations.....	17			35		2			22		
			64			24	48	32			

1 None.

2 Considerable.

Completion of data, by counties, on cooperative demonstration work in rural sanitation in the fiscal year 1921—Continued.

Counties (or districts)	Fauquier, Va.	Glynn, Ga.	Greene, Mo.	Hamilton, Tenn.	Harrison, Miss.	Henry, Va.	Jasper, Mo.	Lauder- dale, Ala.	Madison, Ala.	Mason, Ky.
Period of work in fiscal year 1921	Oct. 1, 1920, to June 30, 1921.	Aug. 1, 1920, to June 30, 1921.	July 1, 1920, to June 30, 1921.	July 1 to Sept. 15, 1920.	July 1, 1920, to June 30, 1921.	Aug. 1, 1920, to June 15, 1921.	July 1, 1920, to June 30, 1921.	July 1, 1920, to June 30, 1921.	July 1, 1920, to June 30, 1921.	July 1, 1920, to June 30, 1921.
Expenditures:										
(a) Rural sanitation fund (P. H. S.)	\$225.00	\$275.00	\$909.81	\$762.50	\$1,200.00	\$262.50	\$909.81	\$1,173.33	\$2,274.17	\$1,788.34
(b) State	2,237.06					4,034.85		575.00		1,381.28
(c) County	3,431.12	10,419.18	600.00	5,271.67	8,907.18	4,034.85	2,476.27	3,041.00	6,709.55	2,002.75
(d) Municipalities		6,348.89			1,078.81				2,574.96	
(e) Other agencies	1,564.94		10,461.65			\$25.00	8,302.60	3,527.76	2,035.02	1,164.03
Total	7,489.02	17,043.07	11,971.46	6,034.17	11,185.99	9,157.20	11,688.68	8,317.09	13,893.70	6,336.40
Number of lectures	33	31	401		190	23	40	55	24	103
Attendance at lectures	2,995	1,470	12,974		14,619	1,628	4,995	3,170	3,910	3,316
Pieces of literature distributed	18,096	1,093	41,229		8,689	6,001	4,655	3,175	1,780	4,464
Sanitary inspections:										
(1) Private homes	1,190	7,690	48	3,300	5,496	1,069	1,601	4,578	10,243	417
(2) Schools	81	13	191	8	82	65	65	104	52	86
(3) Churches	4		5	6	13			26		14
(4) Stores, markets, etc.	116	1,936	190	130	1,965		347	7,249	80	
Total	1,391	9,639	434	3,444	7,556	1,134	2,013	11,957	10,375	517
Special inspections:										
Food-product places	67	558	28	10	78		169	283	454	3
Physical examination of school children:										
(1) Number examined	2,723	1,913	3,572		2,831	2,283	5,395	3,664	4,305	3,363
(2) Number found defective	1,803	972	2,881		1,896	1,288	4,656	2,711	2,306	1,212
Number treatments induced for correction of physical defects in school children	656	76	1,438				424	11	30	167
Public health nursing:										
(1) Number of visits to cases communicable disease	24	289	262		47	987	783	50	171	701
(2) Number of talks given to groups of persons	106	14	81		132	204	304	36	39	20
(3) Number of visits to give prenatal care	9	14	197		11		221	18	7	83
(4) Number of visits to explain and demonstrate infant hygiene	12	2	1,456		18	167	561	35	433	125

Laboratory examinations:	Positive.....	39	141	218	.....	795	56	179	607	106
	Negative.....	35	211	181	3	1,917	245	594	2,064	310
	Total.....	74	355	399	3	2,712	301	773	2,671	416
Immunization:	(1) Number of complete antityphoid inoculations.....	56	321	28	1	471	14	601	483	455
	(2) Number of complete antismallpox inoculations.....		880	452	5	2,865	445	974	1,274	
	(3) Number of complete antipneumonia inoculations.....	2	(*)	(*)	(2)	(*)	(1)	(2)	(2)	(1)
Animalaria work.....	Number of persons treated for removal of hookworm infection.....	4	40			672	38	21	1	
Venereal disease prevention:	(1) Number of prophylactic treatments.....							4	5	
	(2) Number of curative treatments.....		677	5,961		230		3,919	3,098	211
Number of visits by health officer or his assistant:	(1) To diagnose suspected cases infectious disease.....	45	93	109	17	80	217	157	412	152
	(2) To impose quarantine measures.....	45	51	408	12	29		66	210	125
Number of cases quarantined.....		45	45	570	11	817	62	107	191	212
Sanitary privies installed:	L. R. S.....	6	43	18			42	85	36	16
	Concrete vaults.....									
	Bucket and box.....	838	40		13		6	63	86	1
	Pits.....	999				55	659	144	112	2
	Total.....	1,843	43	18	13	55	707	292	234	19
Septic tanks installed:	Number of privies repaired so as again to be of sanitary construction.....	1,068	140	14		1,981	18	20	258	22
	Number of new sewer connections.....	30				2	29	4	26	4
	Number of new water connections.....	11				10	32	45	21	4
Number of wells improved.....		2		3				82	34	
Number of springs improved.....							4	8		
Number of public milk supplies radically improved.....		2	41			13			4	
Number of life extension examinations.....						12			314	

None.

2 Considerable.

• Little.

Completion of data, by counties, on cooperative demonstration work in rural sanitation in the fiscal year 1921—Continued.

Counties (or districts)	Muscogee, Ga.	Ottawa, Okla.	San Miguel, N. Mex.	Santa Fe, N. Mex.	Talladega, Ala.	Union, N. Mex.	Walker, Ala.	Walker, Ga.	10 Virginia counties.	Total.
Period of work in fiscal year 1921	July 1, 1920, to June 30, 1921.	July 1, 1920, to June 30, 1921.	Apr. 1 to June 30, 1921.	June 1 to 30, 1921.	July 1, 1920, to June 30, 1921.	Apr. 1 to June 30, 1921.	July 1, 1920, to June 30, 1921.	July 1, 1920, to June 30, 1921.	July 1, 1920, to June 30, 1921.	
Expenditures:										
(a) Rural sanitation fund (P. H. S.)	\$300.00	\$909.81	\$225.00	\$100.00	\$1,999.96	\$248.22	\$818.33	\$1,457.50	\$4,904.80	\$31,460.82
(b) State					953.80				11,131.92	27,960.39
(c) County	23,282.50	4,066.39	2,096.06	595.54	6,457.00	2,556.60	4,961.62	3,907.83	13,275.65	147,139.37
(d) Municipalities	23,282.51									42,698.63
(e) Other agencies		4,359.08		226.40	1,057.58		830.00			42,834.38
Total	46,865.01	9,335.28	2,321.06	921.94	10,468.34	2,804.82	6,609.95	5,365.33	29,312.37	292,063.59
Number of lectures	10	142	64	18	74	31	94	62	413	2,336
Attendance at lectures	220	7,800	1,085	3,048	4,879	967	4,560	5,148	28,703	136,633
Pieces of literature distributed	5,117	3,775	550	960	3,662	225	6,719	5,536	33,358	212,599
Sanitary inspections:										
(1) Private homes	56,840	2,293	283		669	101	1,088	3,085	10,898	127,985
(2) Schools		110	37		11	4	67	48	419	2,169
(3) Churches					5		5	17		184
(4) Stores, markets, etc.	2,790	741	96		207	14	215	380		22,014
Total	59,630	3,144	416		892	209	1,375	3,530	11,287	152,352
Special inspections:										
Food-product places	651	645	75		179	3		87	237	7,702
Physical examination of school children:										
(1) Number examined	2,254	1,842	21		2,086	704	4,831	2,711		63,311
(2) Number found defective	1,203	1,577	18		1,498	462	2,639	1,260		41,507
Number treatments induced for correction of physical defects in school children										
Public health nursing:										
(1) Number of visits to cases communicable disease	3,010	620	1	442	471	125	362			12,000
(2) Number of talks given to groups of persons	108	200	9	12	26	86	139			2,339
(3) Number of visits to give prenatal care	1,573	73	6	37		10	20			3,161
(4) Number of visits to explain and demonstrate infant hygiene	2,220	299	89	343	5	20	34			9,035

Laboratory examinations:									
Positive.....	300	25	24	247	53	185	43	4,510	
Negative.....	786	48	9	836	670	790	72	15,516	
Total.....	1,176	73	33	1,083	723	975	115	20,026	
Immunization:									
(1) Number of complete antityphoid inoculations.....	817	1,815	1	1,791		2,890	293	15,937	
(2) Number of complete antismalpox inoculations.....	1,122	205		526		2,167	583	20,025	
(3) Number of complete antipneumonia inoculations.....		71					1	268	
Antimalaria work.....	(2)	(1)	(1)	(2)	(1)	(3)	(2)		
Number of persons treated for removal of hookworm infection.....	1			8					
Veneral disease prevention:									
(1) Number of prophylactic treatments.....	27			56		29		907	
(2) Number of curative treatments.....	3,810	887	21	3,445				167	
Number of visits by health officer or his assistant:								27,850	
(1) To diagnose suspected cases infectious disease.....	504	84	146	407	75	118	144	5,066	
(2) To impose quarantine measures.....	935	97	57	178	85	164	35	6,872	
Number of cases quarantined.....	758	128	93	162	123	248	78	8,334	
Sanitary privies installed:									
L. R. S.....				120		19	71	213	840
Concrete vaults.....			2				2	28	430
Bucket and box.....	51	617		480		861	50	631	4,991
Pits.....			4	15	6	149	4	1,650	5,529
Total.....	51	700	4	615	6	1,029	127	2,522	11,790
Septic tanks installed.....									
Number of privies repaired so as again to be of sanitary construction.....								646	753
Number of new sewer connections.....		122	115	20	7	656	81		5,726
Number of new water connections.....	76	321	13	488		67	290	406	2,244
Number of wells improved.....	106	500	3	470		116	289	60	2,047
Number of springs improved.....	35	15		19		45		172	571
Number of public milk supplies radically improved.....	23			20		21	2	48	150
Number of life extension examinations.....	11	70		4	1				322
			6	92					554

¹ None.² Considerable.

PLAN OF WORK.

The plan of work in the fiscal year 1921 was generally the same as that⁷ carried out in the fiscal year 1920. This plan has been evolved in the course of field experience. It has stood the test of time under a wide range of local conditions. Its effectiveness, economy, and logic appear now to be definitely demonstrated.

From follow-up observations in the rural counties of which the Public Health Service, in cooperation with State and local health authorities, made complete sanitary surveys in the period 1914-1917, it was found, as a rule, in those in which local whole-time health service was maintained after the survey sanitation progressed, while in those in which no such service was provided the sanitary improvements resulting from the educational effects of the survey retrogressed. Such observations indicated the advantage of distributing the rural sanitation demonstration work of the Public Health Service in communities in which it would help toward the establishment of local whole-time health service adequate to continue the sanitary work and so make the demonstration lasting. This principle of procedure has been applied in most of the projects in which the cooperative work has been conducted during the last three fiscal years.

A whole-time local health service is established in the geographical unit—a county or a group of townships or of towns—decided upon by the agencies which are to participate in the cooperative project. For the support of such service the money from the different sources, including that from the rural-sanitation funds of the Public Health Service, is pooled so as to make a budget for the year. Under this arrangement the rural sanitation work of the Public Health Service is carried out by a local health force and so made a part of a general program of rural health work indicated in the locality. Thus it is accomplished more economically and with more lasting effects from a demonstration standpoint than it could be if undertaken by a specialized force working a comparatively short time in the locality. The members of the local health forces, consisting of whole-time county or district health officers, whole-time sanitary inspectors, and whole-time health nurses, are appointed by the proper local authorities, but they must be acceptable to each of the cooperating agencies. The only ground upon which the interests of all the cooperating agencies can meet is that of fitness of the personnel to render efficient services, and with such expressed understanding the local authorities at times in making the appointments may be relieved of local political embarrassment.

The different branches of health work indicated in the locality are taken up in what appears to be the logical and most advantageous sequence. The local health officer, at the head of the demonstration unit, in determining sequence and methods of work, has from time to time the advantage of advice and counsel from broadly experienced representatives of the State board of health and the Public Health Service. Every salient branch of health work—including safeguarding of water and food supplies, sanitary excreta disposal, fly control, antimalarial measures, acute communicable disease control, infant and maternity hygiene, school inspection, antituberculosis and

⁷ Reprint No. 615 from Public Health Reports of Oct. 1, 1920.

antivenereal disease measures, industrial hygiene, etc.—is carried out in the demonstration projects. The economy of having all such related activities carried out under one local administrative direction rather than under multiple direction, as would be the case with numerous separate specialized health forces operating independently along the different lines of health work in the same locality, is readily apparent. Under this plan of unified local health service overhead expenses and clerical work may be reduced to a minimum, so as to constitute but a small fraction of what they would be under a plan of incoordinated, multiple, separate health activities in a community.

The plan of cooperative rural health work by the Public Health Service has been found to be adjustable to the differing governmental and other local conditions in the different States. In the Southern and Western States generally the county government is the unit of rural government with which, as a rule, the Public Health Service and the State board of health negotiate the cooperative arrangements. In the New England States, with the town as the unit of rural government and with many of such towns having each a population (of less than 2,000) too small to support economically a whole-time town health service, the problem of adjustment appeared more difficult. It was, therefore, with particular interest that, upon the request of the State commissioner of health, negotiations were undertaken in the fiscal year 1921 to develop a cooperative rural health project in Massachusetts.

THE CAPE COD PROJECT.

In the autumn of 1920 representatives of the Public Health Service and of the State department of health at a joint meeting of members of the boards of selectmen and the local boards of health of the 14 towns in Cape Cod, Mass., presented for consideration a proposition for the establishment of a system of whole-time health service in that part of the State. The proposition presented was for the towns to go into partnership for whole-time health service by pooling their appropriations for health work and having the same person serve as health officer for each of the towns entering into the combination. The members of the local boards regarded the proposition favorably and agreed to present it to the next town meetings in their respective towns. At the town meetings, held in the spring of 1921, 10 of the towns were authorized by a unanimous vote of the citizens assembled to enter into the combination. Thus these 10 towns were constituted a special sanitary district. A health officer was engaged for whole-time service in the district and was appointed as health officer of each of the towns in the group. As assistants on the district health force a sanitary inspector and an office clerk were engaged. A system to coordinate advantageously the work of several health nurses engaged by civic organizations or by separate towns in the group with the activities of the district health force was inaugurated. The budget for the support of the district health work for a period of 12 months was \$7,600, of which \$5,100 was appropriated by the 10 towns and \$2,500 was allotted from the rural sanitation funds of the Public Health Service. The appropriations by the towns to obtain this whole-time health service exceeded but little the amounts expended

by them in each of the several previous years for part-time, unsystematic, and comparatively ineffectual health work. The active work of the whole-time district health department on Cape Cod was begun in May, 1921, and at the end of the fiscal year was giving promise of highly gratifying success.

SPECIAL DEMONSTRATION WORK IN 10 VIRGINIA COUNTIES.

The special line of demonstration work in rural sanitation which was carried out in 11 counties in Virginia in the fiscal year 1920 was carried out in 10 counties⁸ in that State in the fiscal year 1921. This special line of demonstration work has proved highly successful and has a wide range of applicability among counties in which effective health work, if begun at all, must be begun on a low-cost basis. The following excerpt from a report submitted to the Rural Sanitation Office by Surg. W. F. Draper presents the plan of progressive rural health work which is being carried forward in Virginia:

Among the 100 counties in Virginia are many which have never made provision for organized public health work of any kind and in which sentiment for such work is confined to a very few people. To secure from these counties appropriations of several thousands of dollars for the support of adequate, well-balanced health departments is an impossibility at the present time. The only way in which this can be accomplished is by introducing first the simplest and least expensive form of public health work which will be effective, and gradually adding to it as public interest and public sentiment develop.

The demonstrations of rural health work in Virginia are planned so as to enable any county to undertake at the start the one line of work which, for that particular county, will yield the greatest results in lives saved and sickness prevented for the money which is available. As the work progresses, and as its value becomes apparent to the citizens of the county, appropriations may be increased so as to include the line of work which will yield the next greatest returns, and so on in logical sequence, until the public health structure is completed. By this method of development the people are enabled to keep pace with the work and are ready to approve and accept each additional step because of the merit and worth of those which have gone before. While such a process of development may extend over a period of years it is permanent when completed.

Almost every stage in the development of county health work was in progress in Virginia at the end of the fiscal year 1921, as is shown by the following:

First stage (five counties):

County sanitary officer—

Appropriations—

United States Public Health Service-----	\$300
State board of health-----	700
County-----	1,500

Total----- 2,500

In this stage may also be included 39 counties in which a public health nurse is employed alone by the county, either with or without State or Red Cross financial assistance.

Second stage (five counties):

County sanitary officer and public health nurse—

Appropriations—

United States Public Health Service-----	\$300
State board of health-----	1,200
County (including extra governmental agencies)-----	3,500

Total----- 5,000

⁸ Bath, Charlotte, Chesterfield, Greensville, Lunenburg, Northumberland, Orange, Richmond, Roanoke, and Wythe.

Third stage (five counties) :⁹

County health officer, public health nurse, sanitary inspector, and clerical assistant—
Appropriations—

United States Public Health Service.....	\$300
State board of health.....	2,500
International health board.....	2,500
County (including extra governmental agencies).....	5,000
Total.....	10,300

Fourth stage (four counties) : County health officer, public health nurse, sanitary inspector, and clerical assistant—appropriations—\$8,000 to \$15,000, all derived from county sources.

Appropriations—\$8,000 to \$15,000, all derived from county sources.

In the cooperative county health work, in which the Public Health Service has participated during the fiscal year 1921, the appropriations have been derived as follows:

United States Public Health Service.....	\$5,696.91
State board of health.....	13,727.44
Counties (including extra governmental agencies).....	48,211.91
Total.....	67,538.26

The development of the first stage of health work in counties in which no public-health activities were being conducted has constituted the greater part of the work of the Public Health Service in Virginia. At the beginning of the demonstrations in 1919 cooperative work of this character was established in 10 counties, the full number that could be undertaken with the Federal and State appropriations available for the purpose. During the first year the work was conducted on a \$2,000 budget for each county, \$1,000 being derived from the county and the remaining thousand being contributed by the State and Public Health Service.

At the end of the first year, six of the counties provided for continuation a second year and appropriated \$1,500 each instead of \$1,000 in order that the salaries of the sanitary officers might be more in proportion to the services they had rendered. The State and Public Health Service allotments remained the same, making the county budgets \$2,500 each.

Two of the ten original counties appropriated \$5,000 each in order that they might enter the third stage of work. The remaining two counties made no provision for continuation.

In 1920 four new counties were secured to fill the places of the counties which had advanced to a higher stage or which had discontinued, the demonstrations being conducted throughout the year in 10 counties as before.

During the second year 5 of the 10 counties advanced to the second stage by employing a public-health nurse in addition to the sanitary officer.

Up to July, 1921, three counties have completed their second year of work and two of them have provided for continuation a third year upon the same basis as before. It is assured that practically all of the remaining counties will provide for continuation. A new county has been secured to fill the place of the one which discontinued the work, and other counties have signified their intentions of providing for the first stage of work in the event that a vacancy occurs.

One of the original counties which advanced to the third stage after the first year has returned to the second stage for its third year.

The educational value resulting from the first stage of work and its success in demonstrating the benefits to be derived are best shown by the action of the counties in providing for continuation from year to year or in advancing to higher stages.

GENERAL PROGRESS IN RURAL HEALTH WORK.

It is gratifying to be able to report that notwithstanding the general economic depression substantial progress was made in the development of whole-time rural health service in the United States

⁹ The Public Health Service is participating in three of these counties.

during the fiscal year. Ohio went to the head of the list of States for number of counties provided with whole-time health departments. Progress deserving especial mention continued in Virginia, North Carolina, Georgia, and Alabama and was made in Missouri. Largely as a result of the demonstrations effected by the cooperative rural health work in Greene and Jasper Counties, Mo., the State Legislature of Missouri made an appropriation of \$20,000 for cooperative rural health work in the biennial period beginning July 1, 1921. Dubuque County, in Iowa, established a precedent for that State by creating a whole-time county health department.

In a number of the counties in which the Public Health Service during the year was participating in rural health work the industrial depression was so acute as to necessitate radical reductions in county expenditures, but notwithstanding this fact the appropriations from the county treasuries for the health work were continued—and in most instances on an increased scale. Some of these instances furnished striking evidence of the appreciation by the local citizens of the relative and the absolute value of the cooperative health work.

Though the progress in the development of whole-time local health service in our rural districts generally is slow, it now is being made on a basis of definitely established facts whose convincing logic eventually may be expected to cause an increase in its rate somewhat commensurate with the importance of the work. That something more than is now being done is necessary for the advancement of the work to a reasonable degree is clear. According to data collected by the Rural Sanitation Office from the State health departments there were in the United States only 154 counties (over 50 per cent rural) which as of January 1, 1921, were provided with local health service headed by whole-time county health officers. This means that less than 6 per cent of our rural communities are provided with local health service approaching adequacy for the protection of the men, women, and children against readily preventable health demotion, premature death, and economic disaster resulting from costly sickness. Such a situation is of grave importance to the individual citizen, to the local community, and to the whole Nation. It surely should be a matter of acute concern with our local, State, and National Governments. In the items for the promotion of our national welfare none appears more important than reasonably adequate procedure for the protection and the promotion of the health of our people.

Rural health work, on account of distances to be covered and other obvious factors, is relatively more expensive than urban health work. Rural health work protects not only the rural but also the urban population. In the United States rural health work has not made and, under existing conditions, can not reasonably be expected to make the progress that urban health work has made. In a critical period of war the defense or the loss of some of our largest cities might be determined by the factor of strength now lost in any one month from incapacity and death resulting from preventable disease in our rural population. Without assistance and stimulation from central agencies, such as the State government and the Federal Government, it now seems clearly established that individual citizens and local communities in our rural districts will not make the

progress in the carrying out of health measures which is critically needed. Our National Government as yet has not done what appears its proper and proportionate part in assisting the States in the development of local rural health service. If the Federal Government has a right to cooperate with the States in any line of work, the indication is definite for it to do much more than it is and has been doing for the promotion of cooperative rural health work. This last statement appears amply justified by the results—recorded in this and previous reports—obtained with the small annual investments made by Congress within the last several years for the cooperative rural health work of the Public Health Service.

RESULTS.

The cooperative projects in the fiscal year ending June 30, 1921, yielded results exceeding in value manyfold the cost in labor and money. Among the results indicated in the tabular statement, to which special consideration may be given, are:

1. Public health lectures presenting the principles and details of sanitation to over 136,000 persons.
2. Over 152,000 sanitary inspections of premises, with plain discussion of findings with occupants of the properties.
3. Physical examination of over 63,000 school children, with notification of parents of defects found.
4. Six thousand two hundred and forty-one recorded treatments effecting correction of incapacitating physical defects among school children brought about by written notifications and follow-up visits to homes of the children.
5. Twelve thousand visits by health nurses to homes of cases of communicable disease to advise and show the afflicted households how to prevent the spread of the infections.
6. Three thousand one hundred and sixty-one visits by health nurses to prenatal cases to advise with and assist expectant mothers in carrying out hygienic and physiological measures making for healthy mothers and healthy babies.
7. Nine thousand and thirty-five home visits by health nurses to demonstrate hygienic measures for the protection of the health and lives of infants.
8. Fifteen thousand nine hundred and thirty-seven persons inoculated for the prevention of typhoid fever.
9. Twenty thousand and twenty-five persons vaccinated against smallpox, a disease which now should be obsolete in civilized communities and which can be made so by thorough vaccination.
10. Twenty-eight thousand and seventeen treatments to rid persons of venereal disease infection and prevent the spread of the infection.
11. Eight thousand three hundred and thirty-four cases of dangerous communicable disease quarantined to prevent spread of infection in the local community, the State, and throughout the country.
12. The installation of 11,790 sanitary privies and of 753 septic tanks with flush water-closets at homes previously provided with grossly insanitary privies or without toilets of any kind.
13. Five thousand seven hundred and twenty-six privies repaired so as again to be of sanitary type and provide sanitary protection,

restore confidence in the system, and maintain a demonstration of the important principles involved.

14. Two thousand two hundred and forty-four homes connected for the first time with sanitary sewers.

15. Two thousand seven hundred and sixty-eight homes provided with clean water supplies in place of contaminated water supplies.

16. Radical improvement of 322 public milk supplies, distributed to a considerable extent through the channels of interstate commerce, to prevent the spread, through that important and economical food, of such infections as those of typhoid fever, scarlet fever, diphtheria, tuberculosis, septic sore throat, and infant diarrhea.

17. Five hundred and fifty-four persons over 40 years of age examined and advised about their need to consult private physicians about methods to conserve their vital capital.

The range and the number of the results obtained indicate the comprehensiveness and the effectiveness of the work. The value of a human life saved can not be measured in dollars and cents, but if consideration be given only to the monetary loss from sickness which was prevented in these demonstration projects the economy of this business can not be questioned.

Reference was made in the report for the fiscal year 1920 to Madison County, Ala., as an example among the cooperative projects in which a radical reduction in death rate had been effected by the work at a cost of \$66 per life saved. In the fiscal year 1921 the death rate in that county continued low, the total number of deaths reported in the county's population of 50,000 being about 350 less than that reported in each of the several fiscal years before the whole-time county health service was established.

CONCLUSION.

The demonstration rural health work of the Public Health Service has succeeded to such a degree that it now should be put on a co-operative basis so that any rural community in the United States ready to do its proper part might receive from the Federal Government due and logical assistance in the development and maintenance of reasonably adequate local health work.

STATISTICAL WORK.

The work of arranging and interpreting the statistics collected in the field investigations of diseases has been most valuable in making available information which otherwise could not have been used. Progress has been made in the development of standardized sickness records especially for use in the collection, compilation, and analysis of data relating to industrial morbidity. The studies of child hygiene and pellagra also involve expert statistical knowledge. Under the section "Sanitary Reports and Statistics," page 257, there is given a detailed report of the work of the Statistical Office.

STREAM POLLUTION INVESTIGATIONS.

The studies of problems relating to stream pollution begun by the service in 1913 and pursued continuously since that date, except for a period of two years during the war emergency, have been directed

chiefly toward developing basic facts and principles of general application, such as improved methods of chemical and bacteriological examination of water, sewage, and other wastes; methods for effective treatment of important industrial wastes, and quantitative studies of the natural processes of purification which take place when sewage is discharged into open waterways. A considerable number of minor local investigations have, however, been undertaken each year at the request of State authorities, to assist in the solution of urgent local problems of sewage disposal or water supply; and the more general continuing studies are organized with a view to furnishing the services of especially qualified engineers for these occasional details.

As organized during the past year, under the general direction of Surg. W. H. Frost, the stream pollution investigations comprised three main divisions, namely, an investigation of the Illinois River; a study of the biochemistry and treatment of sewage and industrial wastes; and a permanent central laboratory at Cincinnati for basic laboratory studies and for miscellaneous occasional investigations, each of these divisions being under the immediate direction of an associate sanitary engineer.

I. Illinois River investigation: Associate Sanitary Engineer J. K. Hoskins, in charge.

During the spring and summer of 1920 arrangements were made with the directors of the Chicago Sanitary District whereby their active cooperation, indorsed by the State health authorities, was enlisted in a thorough study of the pollution and natural purification of the Illinois River, and Associate Sanitary Engineer J. K. Hoskins was assigned in July, 1920, to organize and direct the work.

The Illinois River, formed by the junction of Des Plaines and Kankakee Rivers near Joliet, about 54 miles south of Chicago, flows through Illinois to empty into the Mississippi, a distance of 327 miles. The Chicago Drainage Canal, completed and put into operation in 1900, connects the Chicago River with the Des Plaines River, reversing the flow of the former, so that the sewage of the Chicago sanitary district, formerly discharged into Lake Michigan, is diverted through the canal to the Des Plaines and thence to the Illinois River, which thus receives, near its source, the sewage from a population of about 2,500,000.

This river was selected for special investigation because it offers an exceptional opportunity to study the processes of natural purification in a flow of over 300 miles; because a precise determination of present conditions is necessary for the future development of proper plans for disposal of the wastes from the Chicago sanitary district; and because the Chicago sanitary district was prepared to furnish very substantial assistance in the study, making the results of their own extensive studies freely available and supplementing the laboratory work undertaken by the Service.

Work during the first six months of this investigation was confined to collecting and analyzing the extensive data already available from various sources, chiefly from the Chicago sanitary district, the United States Army Engineer Corps, the United States Geological Survey, and the Illinois State department of health; in making a preliminary survey of the river and its watershed, and in

making necessary arrangements for supplementary stream-flow measurements. During this period a temporary office was maintained in Chicago, the material collected being forwarded to Cincinnati for compilation.

Upon completion of this preliminary work headquarters for the investigation were transferred to Peoria, the most central point on the river; and during the latter half of the fiscal year a series of temporary laboratories was established at suitable points on the river for the chemical, bacteriological and biological examination of samples collected from the river at frequent intervals. By the close of the fiscal year laboratories had been established at Peoria, Beardstown, Kampsville, and Joliet, Ill.

The laboratories at Peoria, Beardstown, and Kampsville are equipped and operated wholly by the Public Health Service, while that at Joliet, though operated by the Public Health Service, is equipped largely by the Chicago sanitary district, which also provides a part of the laboratory personnel.

In addition to these laboratories, established especially for the study of the Illinois River, is a laboratory operated by the Chicago sanitary district at Argo, on the Drainage Canal, where observations are being made upon a schedule uniform with that followed at the Public Health Service laboratories. Also an important part of the laboratory work and other work in connection with the Illinois River investigation is being carried on at Cincinnati.

The work done in the Illinois River laboratories comprises chiefly examination of samples of water collected daily or on alternate days from some 40 sampling stations located on the Illinois River and its major tributaries. These laboratories undertake only such examinations as must be made immediately, chiefly bacteriological examinations and determinations of dissolved oxygen content, together with such simple chemical determinations as require only simple technique and equipment. Biological examinations and sanitary chemical analyses, which require more elaborate technique and special equipment, and which need not be made upon the same day when samples are collected, are all made at Cincinnati, the samples collected upon the Illinois River being shipped thither after proper measures for their preservation are taken. By this arrangement it is possible for one chemist and one biologist located at Cincinnati to make all these special examinations, thus avoiding the expense of providing additional personnel and equipment at the Illinois River laboratories. Also, for similar reasons, all bacteriological culture media used in the Illinois River laboratories are prepared at the Cincinnati laboratory which has ample equipment for that purpose, supplies being sent out to each laboratory weekly.

At the close of the fiscal year the organization of the work had been completed, and it is planned to continue the work upon the present schedule throughout the ensuing year in order that the observations may extend through a full cycle of seasonal conditions; or, if the funds available do not permit this, to continue until the spring of 1922. It is certain that these observations extended over a year will afford a much more accurate picture of conditions in the Illinois River than has ever before been presented; and, it is confidently expected that, when correlated with the results of the similar

study made upon the Ohio River they will furnish data from which the basic laws of stream purification can be determined with sufficient precision for general application in formulating future policies for the control of pollution, not only in the Illinois River, but in other waterways as well.

II. Studies of the biochemistry and treatment of sewage and industrial wastes: Associate Sanitary Engineer H. B. Hommon in charge.

The main work of this division during the past year has been a detailed study of 15 sewage-disposal plants in operation in 12 cities in the eastern half of the United States for the purpose of securing first-hand, uniform, and comparable data regarding the efficiency of these plants as actually operated. The plants selected for study include all the standard types in general use in this country excepting intermittent sand filters.

Each of these plants was visited first by a sanitary engineer, who made a detailed survey from the standpoint of construction and operation. Following this a uniform series of chemical tests were made daily for a period of two weeks or more at each plant by a chemist of the Public Health Service.

A report upon the results of this survey is now in progress and will be ready for publication within about two months. This report, presenting full data upon the construction, operation, and efficiency of such a number of plants, fairly representing the various types in use in this country, promises to be of material value to sanitary engineers, who have long deplored the lack of such data.

A report prepared by Associate Sanitary Engineer H. B. Hommon on "The Purification of Creamery Wastes," presenting the results of experiments conducted prior to 1918, was submitted for publication during the year, and has since been issued as Public Health Bulletin No. 109. Another report on "The Purification of Tomato Canning Wastes" has been submitted to the bureau for publication and is now in press.

Owing to lack of funds for undertaking further experimental studies of the treatment of sewage and industrial wastes, it was decided during the year to discontinue these studies for the present. Associate Sanitary Engineer H. B. Hommon was accordingly relieved of this work and assigned to duty with the Department of the Interior in the sanitation of national parks, and the remaining personnel engaged in studies of industrial wastes were transferred to other duties.

III. Cincinnati laboratory; experimental and miscellaneous studies: Associate Sanitary Engineer R. E. Tarbett in charge.

The stream pollution laboratory, which has been maintained at Cincinnati since 1913, was operated during the year chiefly as a base for hydrometric computations and special laboratory work in connection with the Illinois River investigation and for miscellaneous special investigations in adjacent territory.

Work in connection with Illinois River investigation.—A very considerable part of the work of the Illinois River investigation has been carried out at Cincinnati, occupying practically the whole of the personnel at that station during the latter months of the year. The main items in this work are: The compilation of hydrometric data for computations of the discharge and velocity of the Illinois River

at all sampling stations under varying conditions of gauge height; the preparation of all bacteriological culture media used in the Illinois River laboratories, and the examination of chemical and biological samples collected from the Illinois River. Also much of the work preliminary to the establishment of the Illinois River laboratories was done at Cincinnati, including the improvement and standardization of chemical and bacteriological technique and the purchase of laboratory equipment and supplies.

Studies of the pollution of the Beaver River.—A study of certain problems arising from the pollution of the Beaver River, chiefly difficulties in the filtration of public water supplies from that source, was undertaken during the summer of 1920 at the request of the Pennsylvania State department of health and in cooperation with that department. Studies devoted chiefly to determinations of dissolved oxygen and of hydrogen ion concentration were pursued for about six months by Associate Sanitary Engineer H. W. Streeter and a chemist assigned by the Pennsylvania State department of health, the laboratory work being done in the laboratory of the filtration plant at Newcastle and at Cincinnati. The study was then discontinued owing to insufficiency of funds and personnel on the part of the State department of health and the service. The results of the incomplete study appear to have afforded at least a partial solution of the difficulties experienced in Beaver River filtration plants; but indicate that a complete solution of more general application will require much more extensive research.

Experimental studies in the biochemistry of sewage and water.—The resources of the station have not permitted carrying out any extensive laboratory research during the past year, but a number of minor laboratory studies have been made, relative to the death rate of sewage bacteria in river water, the use of chlorine for sewage disinfection, the preservation of water samples for sanitary analysis, and the technique of various chemical and bacteriological procedures applied in the study of sewage and water.

Miscellaneous details and reports.—An important feature of the work of the station has been the assignment of sanitary engineers to make special surveys and give advice regarding matters of local sanitation. The special assignments of this character, made in each instance by request of the State or Federal authorities concerned, include:

A survey of sanitary conditions in the Yellowstone National Park; a conference with State health authorities of Minnesota relative to disposal of creamery wastes, and investigation of the water supply of Marquette, Mich., by Associate Sanitary Engineer H. B. Hommon; investigations and reports relative to the public water supply of Milwaukee, Wis., and Wheeling, W. Va., by Associate Sanitary Engineer R. E. Tarbett; and the assignment of Mr. Tarbett, at the request of the commissioner of health of Ohio, to assist in the investigation and control of a serious epidemic of typhoid fever at Salem, Ohio.

In addition to the reports rendered upon these local investigations, the following papers were prepared during the year by the personnel of stream pollution investigations:

"The Factors Governing the Selection and Protection of Sources of Water Supply," by Associate Sanitary Engineer J. K. Hoskins, published in the Weekly Public Health Reports;

"The Loading of Filtration Plants," by Associate Sanitary Engineer H. W. Streeter, presented at the annual meeting of the American Waterworks Association; and

"The Industrial Wastes Pollution of the Ohio River," by Associate Sanitary Engineers J. K. Hoskins and H. B. Hommon, prepared for presentation at the annual meeting of the American Public Health Association.

SWANNANOA RIVER, AT OTEEN, N. C., AND VICINITY.

During the past year Associate Sanitary Engineer H. R. Crohurst made a survey of the Swannanoa River in the vicinity of Oteen, N. C., for the purpose of ascertaining the condition of the water which it was proposed to use in a swimming pool at a summer training camp for women. As a result of this survey, the municipal authorities in Asheville agreed that it would not be advisable to use the water from the river for this purpose, but for the city to construct a swimming pool and supply it with water from the Asheville water-supply system.

SURVEY OF WATER SUPPLY AND SEWAGE DISPOSAL AT HOSPITAL NO. 51, TUCSON, ARIZ.

During the past year Associate Sanitary Engineer H. R. Crohurst made a survey and recommendations concerning the water supply and sewage disposal of Public Health Service Hospital No. 51, located at Tucson, Ariz., about $1\frac{1}{2}$ miles south of Rillito Creek.

The present water supply is derived from an old well, drawing water from a depth between 40 and 120 feet below the ground surface. Deep leaching cesspools are used in the disposal of the hospital sewage. This method of sewage disposal is not satisfactory, not only from the sanitary standpoint but from a mechanical and economical standpoint as well.

It was recommended that the water from the present well be chlorinated or boiled before use, and that a sewage-treatment plant should be installed to treat the sewage from the hospital, preferably located on the bank of Rillito Creek.

WATER SUPPLY OF UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 26, GREENVILLE, S. C.

Associate Sanitary Engineer H. H. Wagenhals made an investigation of the water supply of hospital 26 at Greenville, S. C., during the past year. It was found that the water supply which is drawn from the reservoirs supplying the city of Greenville was inadequate and potentially dangerous.

Recommendations were made that the hypochlorite plant be remodeled and that there be definite changes made in its operation. Further suggestions were offered looking toward the permanent future protection of the water supply. A calcium hypochlorite plant

has since been installed at the hospital to disinfect the water at this hospital.

WATER SUPPLY, MILWAUKEE, WIS.

A study of the filtration of the water supply of Milwaukee, Wis., was undertaken by Associate Sanitary Engineer R. E. Tarbett in the early part of 1921 in response to requests from the State and local health authorities. It was found that the water supply was badly polluted and that the chlorination of the water was not sufficient. In view of the fact that in spite of the installation of the activated sludge method of sewage treatment there will be an increase in the pollution entering the lake, Mr. Tarbett reported that filtration of the water is necessary and that further studies should be made of the theory of the hydrogen ion concentration of raw waters in relation to turbidity and to the use of coagulants for application in the treatment of the Milwaukee water supply.

WATER SUPPLY, MARQUETTE, MICH.

An investigation of the cause of the taste and odor in the water supply of Marquette, Mich., was made by Associate Sanitary Engineer Harry B. Hommon during the past fiscal year upon request of the local authorities.

It was shown that the taste in the city water supply obtained from Lake Superior was due to the liquid tar wastes from a wood alcohol plant located near the city. The wastes from the first distillation of wood and those from the crude alcohol were the ones that caused the trouble. Aside from the crude alcohol still, the wastes discharged from other purifying stills did not possess sufficient taste or odor to produce a noticeable effect on the drinking water.

As a result of the investigation the company operating the wood alcohol plant agreed to install evaporators to recover all the tar and other compounds from the two stills producing the wastes that caused the taste and odor in the drinking water.

PURIFICATION OF OYSTERS.

During the year the State conservation commission of New York, with representatives of the Bureau of Chemistry of the Department of Agriculture and the United States Public Health Service, conducted an investigation of experimental purification of polluted oysters on a commercial scale by floating them in sea water treated with hypochlorite of calcium. Passed Assistant Surgeon F. A. Carmelia was the representative of the Public Health Service in this investigation, which took place at Raritan Bay, N. Y. As a result of the demonstrations it was found that such process treatment of all oysters marketed would insure an additional safety factor to public health.¹⁰

EXCRETA DISPOSAL STUDIES.

The board appointed to study the problem of sanitary disposal of human excreta in unsewered communities has continued studies at

¹⁰ Public Health Reports, Apr. 22, 1921, and Reprint from the Public Health Reports No. 652.

Washington, D. C., Arlington County, Va., and Wilmington, N. C., and has arranged to initiate experiments at Fort Caswell, N. C. In addition to the original personnel, Lieut. Col. Charles H. Craig has been designated by Maj. Gen. Ireland to represent the Medical Corps, United States Army.

THE PRIVY AS A FLYTRAP.

The ventilator-flytrap, mentioned in the last annual report,¹¹ has been simplified. The four sides of the wire box have been discarded and its two ends are now fastened, one in the inlet, one in the outlet, of the ventilator flue of the privy, in place of the sheet of screening ordinarily used. Under this plan the flue itself is used as the flytrap by simply substituting cones of wire screening in place of the ordinary pieces of flat screens in general use.

FLY REPELLANTS.

While the privy ventilator as a flytrap can be used to advantage in capturing considerable numbers of flies, especially females, the additional or the independent use of fly repellants or inhibiting substances has distinct advantages. The "drying powders" (earth, ashes, etc.), recommended by various boards of health, are of advantage if properly used, but as their proper use depends upon the cooperation of many people, they are not, in the experience of the board, generally used to their full advantage; they are, of course, applicable only in dry systems of privies. For use in the pail system, water-gas tar seems to offer considerable promise, but, unfortunately, the samples from different gasworks, and even different samples from one and the same gas plant, present considerable variation in odor, certain physical characteristics, and in their effect on flies. Its effect on the common house fly, *Musca domestica*, is more pronounced than is its effect on the rat-tailed larvae, *Eristalis* and *Hermetia illucens*. Each health officer will do well to test the local water-gas tar before he adopts it for routine use. Thus far the board has used water-gas tar obtained from 14 different places, and of these samples 3 were of distinctly more practical value than were the other 11. Comparative tests with "carbolic sheep dips" are being conducted.

CHEMICAL DISINFECTION OF EXCRETA.

The chemical disinfection of excreta in bulk, as part of a method of disposal, has thus far not given much promise of success. The hope for a practical general method of chemical disinfection of polluted mines and polluted fields may well be definitely abandoned as too expensive unless by chance, in exceptional cases, some waste material, as some mine waters or sea water, can be turned in to cover the ground.

DISAPPEARANCE OF BURIED EXCRETA.

Thus far in the Wilmington experiments excreta buried under different conditions has shown pronounced variation in rapidity of

¹¹ Public Health Bulletin No. 111.

decomposition. In general excreta buried superficially and subject to alternate periods of moisture and drying have lost their characteristics (odor, appearance) much more rapidly than excreta buried more deeply, with more constant moisture and greater protection from the heat of the sun.

SAWDUST-DISPOSAL SYSTEM.

The sawdust-disposal system, described in last report, was used during the winter months in the center of a city of about 35,000 inhabitants. No nuisance resulted and the waste ground showed a luxuriant growth of "hogweed" this spring and early summer. There was a considerable saving of the labor involved when compared with the digging of trenches and the hauling to a distance. With the advent of spring and the approaching fly season, because of the location of the work the experiment was discontinued. Chickens from neighboring houses represented the only complicating factor.

TEMPERATURE AS A FACTOR IN THE DANGER OF EXCRETA.

Studies on temperature show the following important data as applied to hookworms and to flies:

CONDENSED HOOKWORM THERMOMETER (INTERNATIONAL OBSERVATIONS).

°C.	°F.	
8.0-10.0...	46.4-50.0....	This is the lowest demonstrated temperature at which hookworm eggs, placed under favorable conditions, have been observed to segment and to hatch out larvæ that reach the infecting stage.
8.0-18.0...	46.4-64.4....	In this range of temperature hookworm larvæ are sluggish to motionless.
20.0-35.0	68.0-95.0....	Favorable to hookworm development and motility.
25.0-30.0	77.0-86.0....	Optimum for development of hookworm eggs and larvæ and for motility of larvæ.
35.0-40.0	95.0-104.0....	Less favorable to hookworm development and motility.
40.0-50.0	104.0-122.0	Eggs have been observed to hatch at 40° C., but in general constant temperatures above 37° C. are reported as unfavorable or fatal for eggs and larvæ. Both eggs and larvæ, however, can stand 40 to 50° C. for a few minutes and survive.
50.0-60.0	122.0-140.0	Fatal to eggs and larvæ in 1 to 5 minutes.
60.0.....	140.0.....	Fatal to eggs and larvæ almost instantly.

CONDENSED HOUSE-FLY THERMOMETER (FROM LITERATURE).

7.2.....	45.0.....	Eggs of <i>Musca domestica</i> did not develop until brought into a warmer temperature.
12.2.....	54.0.....	Larvæ had not matured at end of 8 weeks.
15.6.....	60.0.....	Eggs have been hatched in 12 hours.
19.3-23.9	65.0-75.0....	Duration of life round was 3 weeks.
23.9-26.7	75.0-80.0....	Eggs have been hatched in 8 to 12 hours.
32.2-36.7	90.0-98.0....	Larvæ mature in shortest period in fermenting materials.
37.8-43.3	100.0-110.0	Larvæ leave the hotter portion of the manure.

From the foregoing it would appear that at temperatures below 7° C. (45.0° F.) fly-borne typhoid and hookworm development are excluded, hence the excreta-disposal problem reduces itself chiefly to a question of bacterial diseases spread by water and by vertebrates.

From 8 to 18° C. (46.4 to 64.4° F.) the possibility of hookworm infection must be admitted, but since the worms are sluggish at these temperatures, it is clear that skin infection will not be likely to occur, but that infections which do occur will be by the mouth and therefore will be light cases.

From 54 to 75° F. (12.2 to 23.9° C.) the possibility of fly-borne typhoid must be admitted.

As soon as the temperature passes above 20° C. (68° F.), the excreta (hence the privy also) become more dangerous, as these higher temperatures are more favorable both to hookworm and to flies.

As 25 to 30° C. (77 to 86° F.) represents the optimum for the development and motility for hookworms, it follows that the infections which occur at these temperatures are more likely to be through the skin, and consequently in larger amount and more severe than infections which occur at lower temperatures.

As 23.9 to about 36.7° C. (75 to 98° F.) represents the optimum for fly development, it follows that fly-borne typhoid is more likely to occur in this range.

The obvious conclusion is that at a temperature of 23.9 to 36.7° C. (75 to 98° F.) human excreta reach their greatest potential danger, hence that this represents the temperature range in which the problems of the privy and of excreta disposal reach their greatest potential importance.

Above 35° C. the temperature is less favorable for hookworms, and above 37.8° C. it becomes less favorable for flies (hence also for fly-borne typhoid). Accordingly, the problems of the privy and of excreta disposal begin to decrease in importance above 35° C.

With the foregoing temperature data before us, the conclusion is obvious that, given other factors, such as moisture and shade, as equal, the privy problem becomes more acute in proportion to the length of the season when the temperature varies between about 25 and 35° C.; in other words, that it is more important for our Southern than for our Northern States, hence it is more important for the South than for the North to have good sanitary conditions in respect to excreta disposal.

DANGER OF GROUND WATER POLLUTION.

In last year's report certain experiments in ground water pollution were mentioned. The board is now repeating these in order to obtain further light on the subject. Data for deductions will not be available until next year.

EXISTING LAWS AND REGULATIONS.

The study of existing laws and regulations has been no small undertaking, but all indications are that the time and effort will have been well spent. The uniformity of the provisions in certain localities clearly demonstrates that relatively uniform regulations are distinct possibility; on the other hand, the diversity found to exist in other localities shows the need of placing at the disposal of health officers a general comparison of requirements and of methods of procedure.

Take, for instance, the important question of the distance of a pit privy from a well. Board of health regulations vary in this requirement from 20 to 300 feet; while one board requires that the distance between the privy and the well shall be equal to twice the depth of

the well—in other words, if the well is 200 feet deep, the privy must be 400 feet away; but if there is a surface well 10 feet deep, the privy can be moved up to 20 feet. Few regulations consider the question of the ground-water level or of the nature of the soil, or the nature or depth of the well.

One of the most striking points in connection with the laws and regulations is the fact that in some localities every imaginable obstacle seems to be placed in the path of the family which wishes either to build a privy or to have it cleaned, while in other localities regulations show the difficulty encountered by boards in inducing families to build privies and to have them scavenged.

LEPROSY INVESTIGATION STATION, HONOLULU, HAWAII.

During the year the leprosy investigation station at Honolulu was in charge of Acting Asst. Surg. J. T. McDonald until March 31, 1921, when he resigned. Passed Asst. Surg. W. C. Teufel was in temporary charge from April 1 to May 17, 1921, on which date Surg. H. E. Hasseltine assumed charge of the station.

Most of the work of the station during the year has been along the lines of treatment of the disease, the plan formulated in 1918 being continued. Laboratory activities have been carried on chiefly in the chemical laboratory of the University of Hawaii, under the supervision of Dr. A. L. Dean, president of the university.

During the year 231 patients have been under treatment. All have received one or more intramuscular injections of the ethyl esters of the fatty acids of chaulmoogra oil. Most of these have received the mixed ethyl esters with 2 per cent iodine added. At the same time the majority of these patients have taken by mouth the mixed fatty acids of chaulmoogra oil to which $2\frac{1}{2}$ per cent iodine has been added.

Two groups of five patients each have received weekly injections of the ethyl esters of hydnocarpic acid and chaulmoogric acid, respectively, without iodine or the oral administration of any chaulmoogra derivatives. The patients showed approximately the same improvement as those on the mixed esters of the whole oil. These results indicate that the therapeutic action of chaulmoogra oil is due to the specific action of the fatty acids of the chaulmoogric series.

A few patients have developed marked exacerbations of symptoms and lesions following treatment with the mixed esters and iodine, the so-called "leprous eruptions," accompanied by more or less febril disturbance. In some the degree of discomfort is great, in others negligible. During the latter part of the year a study of this phenomenon was begun but it has not progressed to a point that gives any indication of the solution of the problem.

At the beginning of the fiscal year there were 116 patients in the hospital. During the year 115 were admitted. One was returned from parole, having suffered a relapse. Three of those admitted had been paroled from the Territorial leper settlement at Kalaupapa. Ninety-four patients were paroled from this hospital during the year and five died. Paroles are granted only after examination of the patient by a board of three physicians appointed by the Territorial board of health. This board must be satisfied that

the patient has improved sufficiently to render him not a menace to the public.

There is need of a better system for observing the paroled cases after they leave the hospital in order that we may obtain information as to the permanency of the improvement, or apparent cure, in each case. The paroling of patients, when they are deemed no longer a menace to the community, will probably do more toward segregating dangerous cases than all laws and other means of compulsory segregation can ever accomplish. Many Hawaiians have successfully escaped segregation for years. Since the adoption of the present methods of treating and caring for those afflicted with leprosy, and the inauguration of the parole system, many advanced cases have voluntarily surrendered in order that they may receive such benefit as they may from the treatment which has given such good results. A few paroled patients going to their homes and describing the therapeutic and the administrative methods of the station, has a greater effect in inducing sufferers from leprosy to seek treatment than all the legal requirements or scientific discussions that can be invoked.

The morale of the patients in the hospital is excellent and in striking contrast to that of former days, when a leprous person was doomed to a long term of isolation, in most cases to be terminated only by death. All patients are zealously cooperating with the authorities of the hospital, intent upon becoming free of their afflictions and returning to their homes as useful members of society.

During the year chaulmoogra oil derivatives were furnished by the service to the following:

Venezuela: Requested by the minister of Venezuela (Dr. Don Santos A. Dominici).

Pretoria, Transvaal Colony, South Africa: Requested by the Secretary of the Interior.

French Colony of Tahiti at Papeete: Requested by Mr. J. Henry, third secretary, French Embassy.

Crete, Service de la Léproserie de Spinalonga en Crète: Requested by Mr. John S. Tzamparlis, head, translation office, Department of Lassithi of Crete, Neapolis, Crete.

Trinidad, British West Indies: Request from the surgeon general of Trinidad, received through the State Department.

Ecuador: Request received through the Pan American Union.

St. Thomas, Virgin Islands, naval station: Request received from War Department.

Basutoland, South Africa, Botsabelo Leper Asylum: Requested by Dr. V. M. Macfarlane, deputy principal medical director.

Porto Rico: Request received through acting assistant surgeon G. T. McDonald.

Dr. Arthur William Stillians, 104 South Michigan Boulevard, Chicago, Ill.

Dr. A. Goves, assistant surgeon, care of Rogers & Co., Bombay, India.

Mr. Leandre Drollet, Papeete, Tahiti, South Sea Islands.

Dr. T. Van Leent, Grand Hotel Tara, Weltevreden, Java, Dutch East Indies.

Dr. J. R. Millard, medical superintendent, The Coast Hospital, Sydney, Australia.

Mr. E. Kian Watt, 23-24 Race Course Road, Singapore, Straits Settlements.

Prof. De Mello, of Nova Goa.

Dr. P. Jeasiano, Bulakan, Bulakan, Philippine Islands.

Hon. H. A. van Coenen Torchiana, consul general of the Netherlands, Mills Building, Montgomery and Bush Streets, San Francisco, Calif.

Surg. O. E. Denney, Carville, La.

Dr. Ralph Hopkins, Carville, La.

Dr. F. A. Neal, Arncliffe, 13 Highbury Road, Hitchin Herts, England.

Dr. G. L. Hagman, Nantungchow Christian Hospital, Nantungchow, China.

Dr. H. T. Holland, Mission Hospital, Kashmir, India.

Dr. H. P. Lie, Bergen, Norway.

Director General of Health of New Zealand.

MISCELLANEOUS STUDIES AND SURVEYS.

SURVEYS OF NATIONAL PARKS.

On request from the Department of the Interior, in the fall of 1920, Associate Sanitary Engineer Harry B. Hommon made sanitary surveys of Yellowstone, Yosemite, Sequoia, and General Grant National Parks with reference to water supplies, sewage and garbage disposal, mosquito control, supervision of milk supplies, and kitchen sanitation.

Yellowstone National Park.—Approximately 100,000 people passed through Yellowstone National Park during the past year, and it is expected that a constantly increasing number of persons will continue to visit the national parks.

The survey disclosed the fact that as a general rule the sources of the water supplies are satisfactory, but that the handling of the water in collecting and storage reservoirs was extremely careless, due to the lack of necessary authority, money, and trained personnel. There was evidence of soil pollution to such an extent that it was recommended that immediate steps be taken to install sewage and garbage disposal plants. The handling of food and kitchen sanitation needed attention, and regular inspections by the officer in charge of sanitation in the park were recommended. It was also recommended that the Government should examine the sanitary conditions of the towns located at the edge of the park and cooperate with the respective State boards of health in improving the sanitation of the towns when necessary.

Specific recommendations were drawn up covering the means for developing an organization for supervising sanitary work in the park, an outline of work requiring immediate attention, and an estimate of probable cost.

Yosemite National Park.—It was found by this survey that the problems confronting the superintendent of the Yosemite National Park were those pertaining to the supervision and extension of water

supplies, sewage and garbage disposal, the control over milk supplies, and kitchen sanitation. As a result of recommendations of the service with reference to sewage disposal and other similar problems, appropriations were made available for undertaking the work of improving sanitary conditions in this park.

Sequoia and General Grant National Parks.—Reports on Sequoia and General Grant National Parks were submitted for use by the National Park Service in hearings before Congress. Definite recommendations and estimates of cost were made for sewerage systems and disposal plants to be installed in these parks.

Mr. Hommon's plan for improving the sanitary conditions in the national parks was adopted by the Public Health Service in conference with the National Park Service, and necessary measures for carrying out these improvements are in progress, as described on page 156, under "Domestic quarantine."

TIDAL BASIN BATHING BEACH, WASHINGTON, D. C.

At the request of the Office of Public Buildings and Grounds, War Department, Washington, D. C., in October, 1920, an examination was made by Associate Sanitary Engineer H. R. Crohurst of the water in the Tidal Basin bathing beach in order to determine the efficiency of the chlorinating apparatus for treating the water. Analysis of the water showed that, while it would be considered unsafe for drinking, the chlorinating apparatus at the time of the examination was producing a water relatively safe for bathing.

SANITARY SURVEY OF HINDMAN SETTLEMENT SCHOOL, HINDMAN, KY.

Asst. Surg. (R) H. R. O'Brien, in compliance with a request of a member of the executive committee of the Hindman Settlement School, completed a survey of that school in the fall of 1920. Particular attention was paid to problems of water supply, sewage, and garbage disposal, and recommendations were made for improving insanitary conditions found.

NATIONAL PARK SEMINARY, FOREST GLEN, MD.

Passed Asst. Surg. R. M. Grimm made a brief survey of the National Park Seminary at Forest Glen, Md., on November 6, 1920, making recommendations with a view to safeguarding the health of the students from possible infection through food, water, and milk supplies.

COOPERATION WITH THE BUREAU OF CHEMISTRY.

As in the previous fiscal year, Surg. M. V. Glover has been detailed to the Bureau of Chemistry, Department of Agriculture, in connection with the enforcement of the Sherley amendment to the food and drugs act of 1906.

HYGIENIC LABORATORY.

The laboratory remained under the direction of Surg. George W. McCoy as director and Surg. Arthur M. Stimson as assistant director.

The physical equipment of the station was materially improved early in the year by the addition of the space provided for in the new south building and the addition of a wing to the animal house. These expansions have relieved the congestion heretofore existing. In accordance with congressional provision there has been installed in the south building a fairly complete outfit of apparatus, both scientific and mechanical.

Following are the reports of the various divisions:

THE DIVISION OF PATHOLOGY AND BACTERIOLOGY.

Standardization of botulism antitoxin.—Work was continued on the testing of botulism antitoxins. The potency in type A antitoxin of some of these serums has been found to be considerably higher than in the earlier samples received, type A being the form most often concerned in human cases. The standard antitoxins have been sent to a number of laboratories.

Some experimental work was undertaken to find methods for determining expeditiously the presence of the toxin of *B. botulinus* in suspected foods. A much more rapid method than the feeding of animals with the suspected food consists in the intraperitoneal inoculation of a portion of the food or an extract of the food into animals. White mice when inoculated in this way with a food containing a strong toxin develop characteristic symptoms within a few hours and die within a short period. The test thus becomes an aid to the early diagnosis of suspected cases and by the use of control mice previously inoculated with antitoxin it may afford information as to the type of serum which would be most effective for treatment of the disease. The results of this work appear in the Public Health Reports, July 22, 1921.

Biologics (routine examinations).—There were received and tested during the fiscal year ending June 30, 1921, 3,235 biological specimens. The following tabulation gives the data in detail:

	For purity.	For potency.
Diphtheria antitoxin.....	117	96
Tetanus antitoxin.....	29	35
Antimeningococcic serum.....	215	215
Antipneumococcic serum.....	225	225
Antidysenteric serum.....	19	19
Miscellaneous sera.....	191	.....
Vaccine virus.....	137	28
Rabies vaccine.....	30	.....
Tuberculin.....	66	.....
Typhoid and paratyphoid vaccines.....	127	127
Miscellaneous bacterial vaccines.....	407	.....
Diphtheria toxin-antitoxin mixture.....	24	24
Pollen extract.....	8	.....
Animal epidermal and food protein extracts.....	4	.....
Arsphenamine and allied preparations.....	1,505	1,060
Total.....	3,104	1,829
Grand total.....		4,953

On some of the above specimens a single test was made, but many of them required two or more tests for check purposes.

The sensitiveness of leucocytes to acid.—This problem came up in connection with the use of leucocytes for the tropin test as applied

to the determination of potency of antimeningococcus serum. It was found that the test sometimes failed because the leucocytes had been injured by coming in contact with acid solutions. In the course of preparation of the leucocyte suspension acid solutions may be encountered in several ways: (1) The sodium citrate used for taking up the exudate may be sufficiently acid to injure the leucocytes. That prepared by certain chemical firms was regularly found acid in reaction. (2) The organisms in the test antigen may produce acid. (3) Normal salt solution standing in the laboratory may become acid by absorption of CO_2 from the air.

With a knowledge of the sources of acid which may cause injury to leucocytes, it is possible to prevent the latter from coming in contact with acid solutions, and the tropin test has been made practicable for the quantitative determination of antibodies in immune serum.

An observation of theoretical interest which was made in the course of the above study was that in the case of lactic acid, as compared with hydrochloric acid, there is some other toxic factor in addition to the injury caused by the free H-ions in the medium.

Choice of meningococcus strains for production of commercial serum.—In the course of the studies on meningococcus in 1918-19, it was found that some cultures under artificial cultivation were not entirely stable in respect to their antibody relationships. Certain cultures changed some of their properties relating to agglutinin types, and certain cultures lost their power for producing tropins when injected into rabbits.

Therefore, the 12 strains recommended to the manufacturers in 1919 for antigens for the production of antimeningococcus serums were studied again to detect deterioration in antibody producing powers, as determined in rabbits. Three of the 12 strains were found to have deteriorated so that they were no longer suitable for antigens, and they have been discarded.

Twenty freshly isolated strains have been studied for their antibody producing powers to obtain strains to replace those discarded. One of these strains was found which showed no relationship to any of the hitherto known tropin groups. It was therefore designated by a new group name and added to the collection of strains, making 13 strains in all now recommended to the manufacturers.

Antipneumococcic serum.—In connection with the routine protection test to determine the potency of antipneumococcic serums considerable time has been spent in an effort to increase the accuracy of the test by securing cultures of uniform virulence. It has been found that the hydrogen ion concentration and turbidity of the broth cultures used are largely the determining factors. Cultures of the same age vary widely in pH value and turbidity, depending upon initial reaction of the broth, amount and age of the inoculum, length of incubation, amount of carbohydrate present, etc. Additional experiments are necessary for the confirmation of these observations.

Pneumococcus vaccine.—A number of commercial pneumococcus vaccines were tested for potency. Although the method used was tentative, it was thought that some information of the values of the vaccines might be gained by comparing one with another.

It is difficult to show the presence of antibodies very definitely, and agglutination, bactericidal, and tropin tests gave negative results or

only slight reactions. The animal-protection test appeared to be the most advantageous, though at best this test is cumbersome and not entirely satisfactory, owing to the considerable number of animals required and the variability in resistance of animals.

It was found that protection was afforded quite effectively against Type I cultures with a number of vaccines, but the results obtained against Types II and III were usually not very satisfactory.

Considering general results, it seemed readily possible to distinguish between an entirely worthless vaccine and one which might be of some practical value.

Standardization of antistreptococcic serums.—Effort was made during the past year to find a satisfactory method of standardizing antistreptococcus serums. Investigation has shown that this depends upon the solution of several interrelated problems, such as the determination of definite species and their etiological relationship to certain pathological processes. A major portion of the time devoted to this problem has been spent on the mouse-protection test. Monovalent rabbit serums were prepared by the injection of selected cultures, the virulence of which was raised by animal passage. Also, two polyvalent horse serums have been obtained. These monovalent rabbit serums and the polyvalent horse serums were tested along with a number of commercial serums for their protective properties against highly virulent cultures of *Streptococcus hemolyticus*. The cultures used in these protection tests were the four types selected by Dochez, Avery, and Lancefield as representative of the hemolytic streptococci isolated from diseases of the respiratory system, and cultures from the Hygienic Laboratory collection. The results of the protection tests were in general unsatisfactory.

It was also thought that possibly a highly protective antistreptococcus serum might be obtained in rabbits by the injection of toxic filtrates of hemolytic streptococci. This was done, but the results were disappointing; practically no protection was afforded.

In view of the fact that chickens are very resistant to streptococci, it was thought that it might be possible to obtain a potent serum by injecting them with large numbers of living organisms. The chickens were under treatment 14 months, when they were bled and their serum tested by the protection method. The highest protection (0.5 c. c. of serum against 0.01 c. c. of broth cultures) was afforded by homologous cultures.

Standardization of antidysenteric serums.—After the appearance of the work of Olitsky and Kligler on the toxins of *B. dysenteriae* Shiga, experiments were begun with these toxins in an effort to standardize the commercial antidysenteric serums against them. Attempt to immunize horses with the separated exotoxin (neurotoxin) and endotoxin (enterotoxin) resulted in the death of one horse, for which a goat was substituted. These animals are still under treatment. Protection tests have so far failed to show any appreciable amount of antitoxin in the serum from either the horse or the goat.

Controlling potency of vaccine virus.—Following largely the work of the French, an improved method for controlling the potency of vaccine virus has been elaborated; this consists of the application in a series of dilutions of the vaccine virus to be tested on one side of the back of rabbits in comparison with a control vaccine on the other side. Applied to a series of commercial samples which were later

checked by primary human vaccinations, the rabbit test gave results which indicated the potency actually found in human use.

In connection with this laboratory test for potency more specific directions for the use of vaccine virus in clinics and in private vaccinations have been elaborated and published in the Public Health Reports. These methods are aimed, first, at preventing prolonged local lesions by the use of minimal insertions and the abandonment of all dressings for the vaccinated area; and, second, at securing uniformly successful vaccinations (either vaccinia in the case of primary vaccinations, or a reaction indicating immunity in those previously immunized), by keeping the vaccine on ice, and by prolonged application of the virus to the area of insertion at the time of vaccination.

Standardization of antianthrax serum.—Work on this serum has been much restricted on account of the lack of suitable space in which to carry out experiments with the dangerous organism. Nevertheless, the few experiments performed indicated a strong probability that a satisfactory protection test could be devised of sufficient delicacy, at least, to distinguish between serums of usable and those of inadequate potency.

Pasteur treatment.—The administration of the Pasteur treatment at the Hygienic Laboratory and the preparation of virus for State boards of health was discontinued on January 1, 1921.

During the six months from July 1 to December 31, 1920, material for 835 treatments was sent out and 14 patients were treated at the Hygienic Laboratory, making a total of 849 treatments.

The antirabic service was instituted at the Hygienic Laboratory on April 28, 1908, and continued with practically no interruption until January 1, 1921, a few months short of 13 years.

STUDIES ON INFECTIOUS DISEASES.

3. *Alastrim.*—Studies on alastrim, an eruptive disease prevalent in the West Indies, have indicated its immunological identity with the mild smallpox prevalent in the United States since 1896. Alastrim, using material from Haiti and from Jamaica, has been successfully transmitted to monkeys, through four generations in the case of material from Jamaica. Cross-immunization tests with alastrim and smallpox, with alastrim and vaccine virus, and with vaccine virus and smallpox have in each instance been positive; even rabbits, which present no noteworthy eruption when inoculated with alastrim material, have been thereby immunized to a large extent against vaccinia. A survey of the descriptions of Kaffir milkpox, Amaas, and Sanaga pox, reported in Africa; "the Australian disease," reported in New South Wales and New Zealand; varioloid varicella in Jamaica and Trinidad; and alastrim in Brazil and the West Indies, indicated a similar identity of this entire group of outbreaks.

Smallpox.—In connection with the recent increased prevalence of smallpox in the United States a consideration of the laws and regulations in 20 States which have consistently reported smallpox morbidity to the Public Health Service for the past six years has shown an interesting connection between incidence and legislative preventive measures. In general, the smallpox rate has been low

in the Eastern States, moderately high in the Southern States, still higher in the Central States, and increasing from a low rate to a very high one in the States of the Pacific coast. However, in each geographical group the incidence of smallpox per 1,000 population has seemed to be almost a corollary of the legal means of thoroughly enforcing vaccination, particularly the vaccination of school children.

Tularaemia Francis, 1921 (deer-fly fever).—Tularaemia has been the subject of investigation by Surg. Edward Francis throughout the year in Utah and in the Hygienic Laboratory. For the past 10 years there has prevailed in Millard and Boxelder Counties, Utah, in quite limited localities in the months of June, July, and August a disease initiated according to popular belief by the bite of a blood-sucking horsefly; following the bite on some exposed surface of the body (neck, face, hands, legs) the lymph glands which drain the bitten area become inflamed and swollen and commonly suppurate. There is pain and a fever lasting from three to six weeks and convalescence is slow. The investigation has shown:

First, that the human cases are due to the *Bacterium tularense*, an organism discovered in 1912 by McCoy and Chapin as the cause of plague-like disease of rodents in California.

Second, that in the localities in Utah where human cases occurred last year there prevailed at the same time a fatal epizootic among jack rabbits due to *Bacterium tularense*.

Third, that in the localities in Utah where human cases occurred last year there were also present at the same time blood-sucking horseflies of the species *Chrysops discalis*; these flies were proven experimentally to be capable by their bites of transmitting the infection from tame rabbits to tame rabbits, and the conclusion was reached that they probably carry the infection by their bites from sick jack rabbits to man.

Fourth, that the rabbit louse (*Haemodipsus ventricosus*) is capable of transmitting the infection experimentally from tame rabbit to tame rabbit; the practical importance of the latter is that it offers an explanation of the means by which the infection is perennially kept alive in the jack rabbits of Utah.

Plague.—The outbreaks of bubonic plague in a number of ports of the Gulf of Mexico made it desirable to carry on such researches as might be practicable. Recommendations were made and approved for supervision of such work, to be centered at the Hygienic Laboratory. A considerable volume of immunological work was done at the Pensacola station, together with some experiments on the migration of rats and on the efficiency of viruses used to destroy rats. The results will need to be checked before they can be considered conclusive. At the Beaumont station antiplague serum was produced, a supply of which is now available at the Hygienic Laboratory. The results, from a research point of view, have not been satisfactory, due to inability to give the work the close supervision which such work needs.

Anthrax.—During the year several cases of anthrax, traceable to shaving brushes, were reported. The shaving-brush manufacturing establishments have been inspected and general conditions found fairly satisfactory. It has become the firm conviction of this office that the solution of this simple and clear-cut public health problem lies in the prohibition of the use of horsehair shaving brushes. Tem-

porizing measures have proven inadequate, though doubtless of considerable value.

Pneumonia.—At the laboratories connected with Bellevue Hospital, New York City, a group working under the direction of Dr. Russell L. Cecil, special expert, have continued attempts to produce practicable vaccines and serums, and have attacked the mechanism of infection. This is a continuing research, and the useful results, if any, that may be had from it can not now be predicted.

Tuberculosis researches.—During the first 10 weeks of the fiscal year these researches were ably prosecuted by Special Expert A. P. Hitchens. Upon his resignation much of the work which we had in hand had to be discontinued, but the very favorable progress made toward the standardization of tuberculin is recorded and requires only to be assembled.

The problems which were later carried on were of necessity of such a nature that technicians could perform the work for the most part, with occasional supervision and direction.

One of these problems was suggested by the commonly reported observation that coal miners are less susceptible than other classes of industrial employees to tuberculosis. A number of series of animals have been subjected to the artificial induction of anthracosis with a view to determining what influence this condition might have on concurrent or subsequent tuberculosis. Owing to the long time necessary for the production of the anthracosis, and occupied by the tuberculosis process none of these series are as yet ready for analysis and report.

There are a number of relatively new therapeutic preparations on the market whose proponents make extraordinary claims for their effectiveness in the treatment of human tuberculosis. On account of the responsibility resting upon the Public Health Service for providing the best possible treatment for its tuberculous beneficiaries, it is necessary to test out such of these preparations as are supported by scientific plausibility.

Among these preparations are the "partial antigens" of Deycke-Much, which have attracted considerable attention, especially in Germany. After much delay a supply of these preparations has been obtained and forwarded for clinical trial to the Public Health Service hospital at Biltmore. A review, translation, and abstracting of the literature was first made at the Hygienic Laboratory and the outline of the procedure to be followed was mapped out. The originators do not claim that the value of the remedy is demonstrable by animal experiment, and as it seemed to be harmless if carefully used, it was decided to submit the antigens to clinical trial.

The workers in tuberculosis research in this division have furnished assistance to those in the division of pharmacology by preparing bacterial suspensions, culture media, and microscopic sections.

It has been the constant aim to direct these researches so that as soon as practicable the clinical applications, if any ensued, could be stressed.

ESTABLISHMENT OF UNIFORM METHODS.

The Wassermann reaction.—The establishment of a uniform procedure for the Wassermann reaction throughout the stations of the

service and associated agencies where the tests made affected service beneficiaries or activities, has been a great desideratum. The Hygienic Laboratory has been engaged during the past year in activities tending toward this consummation, and considerable progress has been made. The method in use at the Hygienic Laboratory was considered applicable for this purpose as being, in the long run, as dependable as any method, while not too cumbersome for general adoption. The laboratories performing Wassermann reactions in connection with the operations of the venereal disease division were first circularized through that division as to their attitude regarding the adoption of this method. Most of these laboratories are under State health organizations. About one half were favorable to the adoption of this method, and standardized reagents prepared at the Hygienic Laboratory have been furnished them in the interest of securing greater uniformity. Of the remaining half, a large number were unable to adopt the method on account of the expense involved in changing the physical outfit. Others preferred to continue the use of their current methods, but in most of these instances the methods were of themselves excellent and to be criticized only on the ground of unnecessary elaboration and refinement. In cooperation with the division of hospitals and relief an arrangement has been made for the adoption of this method throughout the stations of the service proper. Preparation has been made at the Hygienic Laboratory for furnishing certain of the fundamental reagents to any of the above mentioned stations which desire and are in a position to carry out the specified technique. It is hoped that these activities will result in a greater usefulness of the Wassermann tests and the collection of more comparable and dependable statistical data.

Cholera media.—On account of the scarcity of Witte's peptone following the war, it was thought desirable to test several of the American peptones to determine whether they could be used as advantageously as Witte's for the isolation of the cholera organism. Goldberger's technique for the preparation of media (Hygienic Laboratory Bulletin No. 91) was followed and tests were carried out with American-made peptones, with Witte peptone as control. The advantage in the use of the Goldberger media made with Witte's peptone lies in the simplicity and ease of preparation, no adjustment of reaction being necessary owing to the uniformity of the product. The American peptones in general are more acid in reaction and the main part of the work carried out was done with a view to determining whether it would be necessary or advantageous to adjust the reaction of the media made with these peptones.

Summarizing the results obtained, it appears to be desirable to adjust the reaction of peptone solutions and of the Dunham's solutions and agar used as the basis of the egg media to a reaction in the neighborhood of pH 7.2 before the addition of the egg mixture, though in the case of those peptones which do not vary greatly in reaction from this reaction it is not essential.

Disinfectant testing.—During the year considerable experimental work has been done on methods of disinfectant testing which has resulted in the adoption of a new method for phenol coefficient determination. While disinfectants play a minor rôle in public health, and only one class of them is susceptible of intercomparison by phenol

coefficient determinations, it is believed that this work has been justified in that it will render the Government supervision of these products more readily carried out and will enable the manufacturers to put out a more uniform product. A manuscript describing the method has been published in the Public Health Reports, July 8, 1921.

MISCELLANEOUS SPECIMENS.

There were received and examined in the division of pathology and bacteriology 8,628 miscellaneous specimens, most of them of a clinical nature but of collateral value to this station in its research work. The following table shows in detail the various groupings. It will be noted that 366 blood specimens for Wassermann test are listed as "defective." This item includes about 100 lost by breakage of the container in the mails.

Wassermann:	
Positive	807
Negative	5, 863
Anticomplementary	226
Defective specimens	366
	<hr/> 7, 262
Heads for rabies:	
Positive	4
Negative	33
Not examined	8
	<hr/> 45
Smears for gonococci	102
Sputum	226
Urine	146
Tissues	95
Cultures for diphtheria	256
Water and sewage	268
Disinfectants	42
Miscellaneous	186
	<hr/> 1, 321
Total	<hr/> 8, 628

Narcotic drugs.—In accordance with bureau order of February 9, 1921, an officer from the laboratory conferred with several State health officers in regard to the narcotic-drug situation in a number of southern cities. Various narcotic-drug agents of the Bureau of Internal Revenue and a number of practicing physicians were interviewed in addition to visits paid to several institutions where narcotic addicts are treated.

The following tentative conclusions were drawn:

1. Narcotic-drug addicts may be gotten entirely off drugs while under prison restraint.
2. The period of withdrawal of the drug may be varied, but need not exceed 10 days.
3. A supervised period of readjustment following the period of withdrawal is desirable.
4. Ordinary medical care during the period of withdrawal and readjustment renders the procedure more humane and is advisable.
5. Strict control of the addict during the period of withdrawal and readjustment is essential.
6. Strict control of all avenues through which addicts might receive narcotic drugs during their period of withdrawal and readjustment is essential.

7. After addicts of the prisoner class have been gotten off their drug they remain as well as other persons as long as they do not have access to narcotic drugs.

8. Addicts show a great tendency to return to the use of narcotic drugs when released from prison restraint, even though they have been gotten entirely off their drug while in prison.

9. The various interpretations put upon the symptoms exhibited by narcotic addicts upon the withdrawal of their drug have greatly obscured the fundamental principles involved in handling addicts.

10. Until traffic in narcotic drugs is brought under better control few benefits only may be expected from the mere treatment of addiction as a primary object.

DIVISION OF ZOOLOGY.

Since July, 1920, the professor of zoology has had headquarters at the Hygienic Laboratory.

International commission on zoological nomenclature.—The commission has completed its post-bellum reorganization and now consists of the following personnel:

Chairman, Prof. F. S. Monticelli, Naples, Italy; secretary, Prof. C. W. Stiles, Washington, D. C.

Class of 1922 (elected in 1913): Dr. J. A. Allen, New York, N. Y.; Dr. J. A. Bather, London, England; M. Ph. Dautzenberg, Paris, France; Dr. W. E. Hoyle, Cardiff, Wales; Dr. K. Jordan, Tring, England; Prof. H. Kolbe, Berlin, Germany.

Class of 1925 (newly elected; vice class of 1916): Dr. D. S. Jordan, Palo Alto, Calif.; Prof. A. Handlirsch, Vienna, Austria; Prof. F. S. Monticelli, Naples, Italy; Dr. E. Simon, Paris, France; Dr. H. Skinner, Philadelphia, Pa.; Dr. L. Stejneger, Washington, D. C.

Class of 1928 (newly elected; vice class of 1919): Prof. C. Apstein, Berlin, Germany; Dr. E. J. O. Hartert, Tring, England; Dr. Geza Horvath, Budapest, Hungary; Prof. E. Lonnberg, Stockholm, Sweden; Dr. C. W. Stiles, Washington, D. C.

The work of the commission has been going on fairly satisfactorily this last year, except for the difficulties involved in reaching some of the members by mail. Ten opinions have been sent to press.

Index catalogue of medical and veterinary zoology.—The nematode catalogue has been issued as Bulletin 114 of the Hygienic Laboratory. This completes the three subject catalogues on parasitic worms. The demand, by specialists, for these publications has clearly demonstrated their value, and the effort of reducing the groups to a genotype basis is already becoming evident in the world's literature. Work on the host catalogue has not progressed because of pressure of other duties.

Examination for determination of intestinal parasites.—This part of the routine work has continued to some extent, and determinations have been made for various State and local boards of health and for various hospitals.

Specimen collection.—Pressure of other work has precluded the possibility of increasing the collection.

Studies on amebiasis.—Somewhat disquieting reports have been published by excellent observers to the general effect that soldiers who served in Europe during the late war were returning home with a

high percentage of infection with amebic dysentery, and that as "carriers" they were likely to be more or less of a menace to the civil population as well as to themselves. These reports attracted comment in medical journals and medical societies, the substance of which was that it was clearly the duty of the Public Health Service to investigate the outlook, a view with which this service concurred. The practical problem was to examine a considerable number of persons (nonmilitary, and military with domestic and with foreign service) in different parts of the country to determine whether the incidence of infection with *Endameba histolytica* is higher in the troops of foreign service than in the other groups.

A total of 13,049 specimens were received from 8,029 persons, located in 23 States.

Of these 8,029 persons, 1,547 showed a history of no military service. In this group, composed chiefly of institutional cases (prisons, reform schools, laboratories, hospitals), an average infection (with *Endameba histolytica*) of 8.3 per cent (129 persons) was found on an average of 3.1 microscopic examinations per person. Estimated out theoretically this indicates that the actual existing infection (had a sufficient number—6 plus—of examinations per person been made to discover all cases of infection) lies somewhere between 12 and 17 per cent. Institutional life, however, might easily tend to cause a higher rate of infection than that found in the noninstitutional population.

Of these 8,029 persons examined, 2,584 showed a military service in this country but none abroad. In this group, 3.5 per cent (93 persons) were found infected on an average of 1.3 examinations per person. Estimated out theoretically, this indicates an actual infection of 7 to 10 per cent.

Of the 8,029 persons, 362 gave no definite history as to military service. An average of 1.5 per cent examinations per person showed that 3 per cent (11 persons) harbored *Endameba histolytica*, which means an actual infection of 6 to 9 per cent.

For comparison with these three groups, there were 3,536 ex-service men showing a history of foreign service. An average of 1.1 examinations per man disclosed that 2.8 per cent (100 men) had the infection; this indicates an actual infection somewhere between 6 and 9 per cent.

Thus, 3,536 returned ex-service men taken almost exclusively from 35 different Government hospitals were examined, and the microscope indicates that their infection (6 to 9 per cent) is identical with that (6 to 9 per cent) of 362 persons with unknown history, and lower than the percentage (7 to 10 per cent) estimated for troops of only home service, and practically only half as high as the percentage (12 to 17 per cent) estimated for the institutional cases.

In summary, a comparison (1920-21) of the microscopic examination of 3,536 soldiers with foreign service, 2,584 with only domestic service, 1,547 nonmilitary persons, and of 363 persons of unknown military status does not indicate that the returned ex-soldiers with foreign service are on an average a more serious factor in the spread of amebic dysentery than are the other three groups. This conclusion is supported by the fact that the results among the home service troops examined by Kofoid at New York and by this service are practically identical (4.3 and 3.5 per cent).

In order to check these laboratory findings, inquiries were sent to 607 hospitals and 115 medical schools in the Continental United States and in Canada and the Philippine Islands asking whether any increase in clinical amebic dysentery had been observed since the armistice. The result of this inquiry is as follows:

Hospitals:

Number of letters sent.....	607
Number of replies which are definitely negative.....	440
Number of replies which are definitely affirmative.....	15
Number of replies which are indefinite.....	13
Total number of replies.....	468

Medical schools:

Number of letters sent.....	115
Number of replies which are definitely negative.....	59
Number of replies which are indefinite.....	2
Number of replies which are definitely affirmative.....	10
	71

Replies have been received from every State in the Union except Florida, Nevada, New Mexico, South Dakota, and Wyoming.

According to these reports in at least 31 States, clinical amebic dysentery has not increased since the armistice to an extent that it attracted the attention of the hospitals and medical schools which have replied to the inquiry.

Out of 206 replies from 13 of the States of the Union, 24 hospitals or medical schools (11.7 per cent) report that an increase in clinical amebic dysentery has been noticed since the armistice; and out of 528 replies from the hospitals and medical schools in 41 States, 24 answers (71.8 per cent) report an increase in clinical amebic dysentery.

Although the statistics reported are not extensive, they are sufficiently significant to indicate that it would be well to follow this disease closely during the next decade in order to keep properly informed upon its prevalence. By all means, it should be made a reportable disease throughout the country.

The point is, however, beyond challenge that the subject of amebic dysentery should be emphasized in connection with the problem of excreta disposal and that this infection gives added emphasis to this problem.

To attempt to control amebic dysentery by medical treatment of all carriers is not only impractical but it would be an unjustified extravagance, since the money such a plan would require can be used to much greater public health advantage in other ways; but to control it by sanitation is a thoroughly feasible and not an extravagant proposition, since the money expended in sanitation is accumulative in its results in controlling many different infections.

The investigation uncovered unsuspected cases of various infections, of which probably the hookworm (3.9 per cent) and 3 cases of *Dibothriocephalus latus* are the most important.

So far as concerns the duties of the hospitals of this service to its patients, the division of zoology recommends that a routine microscopic examination of the feces should be made of (a) all patients of southern origin, (b) all cases showing symptoms of

anemia or of intestinal troubles, (c) and all cases in which the diagnosis is not clear; but it considers that the routine examination does not seem to be so strongly indicated in the average patients of northern origin.

It further recommends that in cases of known infection with *Endamoeba histolytica*, increased precautions be instituted in sanitation and personal cleanliness.

Among the 8,028 persons, the following more important infections were uncovered by the routine examinations and might have entirely escaped notice if these had not been made: Amebic dysentery carriers or patients, 404 cases (4.1 per cent); tapeworms of the genus *Taenia*, 4 cases; tapeworms of the genus *Dibothriocephalus*, 3 cases; hookworms, 321 cases (3.9 per cent); *Ascaris*, 89 cases; Cochin-China infection (*Strongyloides*), 15 cases (0.1 per cent). Total 836 (10 per cent) cases.

In addition, the following cases of possible (but doubtless much less) importance were uncovered: *Chilomastix mesnili* (256 cases), *Giardia* (522 cases), tapeworms of the genus *Hymenolepis* (41 cases), *Oxvuris* (68 cases), *Trichuris* (170 cases).

Board on excreta disposal.—The professor of zoology has continued to serve as chairman of the board of excreta disposal, with work at Washington, D. C., Arlington, Va., Wilmington, N. C., and Fort Caswell, N. C. The report of the board is printed on page 74.

DIVISION OF PHARMACOLOGY.

Chemotherapy of syphilis.—Considerable progress has been made in the study of arsenicals which are used extensively in the treatment of syphilis. These researches may be grouped as follows:

(1) *Chemotherapeutic action.*—A method has been devised by means of which it is possible to obtain an accurate estimate of the power of drugs to kill the parasites in the body of infected animals. This method was found to be extremely useful for testing the efficiency of various new drugs which are put on the market. It was shown that in spite of the claims made by the manufacturers several of these commercial preparations are greatly inferior to arsphenamine. It was furthermore shown that the intramuscular injection of arsphenamine and neoarsphenamine is at least equally effective as the commonly practiced intravenous method of administration. Considerable work was done on the action of arsphenamine when given in combination with various heavy metal salts. The results obtained indicate that silver, gold, mercury, and iron increase the effectiveness of arsphenamine, as in the presence of these metals smaller amounts of arsphenamine are required to kill the parasites. Test-tube experiments have demonstrated that the heavy metals accelerate the rate of oxidation of arsphenamine to the physiologically active modification. Another research has dealt with the fate and distribution of arsenicals in the body and has led to a better understanding of the reasons why certain arsenicals are more efficient than others.

(2) *Arsphenamine intoxication.*—The investigation dealing with the tissue changes produced by various arsenicals was completed. The results (Hygienic Laboratory Bulletin No. 128) indicate that arsphenamine is more apt to cause liver injury than neoarsphenamine,

whereas the latter is more toxic to the kidney. Diet has a marked influence on the degree of tissue injury, a fact which is of importance in the biological standardization of arsphenamine and in the treatment of patients.

(3) *Treatment of syphilis of the central nervous system.*—The investigation dealing with this subject is not completed, but the results so far obtained indicate that arsphenamine injected intravenously does not reach the cerebrospinal fluid in sufficient amounts to kill the parasites in this fluid. Certain other arsenicals are more effective in this respect, but unfortunately they cause injury to the nervous tissue.

(4) *Biological standardization of arsphenamine.*—As in previous years the division has tested the toxicity of every lot of arsphenamine and its substitutes which is put on the market by manufacturers licensed by the department. This official control has involved a great deal of work, and has been of great importance in eliminating abnormally toxic preparations which might be dangerous to the patient. New standards for additional preparations have been worked out. The number of tests is given on page 82.

Chemotherapy of tuberculosis.—The work on the chemotherapeutic value of chaulmoogra oil and derivatives in experimental tuberculosis has been completed and is now being published. Contrary to the positive claims made for this drug by some clinicians and investigators, a thorough trial of this drug in tuberculous guinea pigs has not yielded even the slightest indication of a beneficial action.

Numerous other drugs have been tested as to their action on the tubercle bacillus in the test tube and in the infected animal. Although some of these drugs are fairly efficient antiseptics in vitro, they do not exhibit any beneficial action in the infected animal.

In order to attack the problem from a fundamental point of view experiments were made on the penetration of drugs into the bacilli, and also on the effect of drugs on the metabolism of bacilli related to the tubercle bacillus. This work has shown that the carbon dioxide production of bacillus butyricus and bacillus subtilis is influenced by acids and alkalis, i. e., there exists an important relation between the H-ion concentration of the medium and the carbon dioxide production of bacteria.

Chemotherapy of anthrax and pneumococcus infection.—Work was begun on the discovery of drugs which might be useful in the treatment of these diseases. For this purpose the toxicity and pathological changes caused by a series of drugs was studied and preliminary work on anthrax-infected guinea pigs was carried out. These latter experiments have yielded promising results, and it is therefore planned to extend the work during the next year.

Treatment of hookworm disease.—The research on carvacrol, a synthetic drug, was completed and the report was published in the Public Health reports. The work on wormseed oil was continued, partly in cooperation with the International Health Board of the Rockefeller Foundation. The experiments with this drug have shown that ascaridol is the chief active constituent of the oil, and work is now in progress with the view of introducing ascaridol, which can be obtained in chemically pure form, as a substitute for the oil. One of the principal difficulties encountered in the extensive use of chenopodium oil is the fact that its chemical composition and

toxicity are subject to considerable variation; ascaridol, on the other hand, being a chemical entity, does not vary in this respect.

Carbon monoxide poisoning.—In view of the great industrial importance of carbon-monoxide poisoning in various industries a study of experimental chronic poisoning with this gas was undertaken. The work, which is not completed, has dealt principally with the following questions: The alleged toxic action of carbon monoxide apart from its action on hemoglobin; the effect upon the growth of animals resulting from repeated intermittent exposure to carbon monoxide; the effect of this exposure on the tissues and the blood; the compensatory mechanism which leads to an increased tolerance to the gas.

Food value of milk powder.—The work on this subject was completed, and the report is in press. The results obtained show conclusively that, with the exception of the antiscorbutic vitamine, the dried milk powders do not show any reduction in food value as compared with fresh milk. The deficiency of antiscorbutic vitamine can readily be adjusted in infant feeding by the addition of orange and tomato juice.

Comments on the United States Pharmacopoeia and National Formulary.—Hygienic Laboratory Bulletins No. 125 and No. 127 have been published, and report the digest of comments on the pharmacopoeia for the calendar years ending December 31, 1917, and December 31, 1918. The manuscript for the digest for the calendar year 1919 is almost completed so that the revision committee is enabled to make use of these publications in the revision of the pharmacopoeia.

A member of the division has taken an active part in the revision of the pharmacopoeia, serving as chairman of the subcommittee on nomenclature, and as a member of the subcommittees on scope and on tables, weights, and measures.

Miscellaneous activities.—The division has cooperated with the Bureau of Internal Revenue and the State Department in the enforcement of the narcotic law. Numerous samples of drugs submitted by the hospital division and purveying depot of the service were examined for purity. Samples of ethyl esters of chaulmoogric acid manufactured by several American firms were tested for purity, and samples of the esters prepared in the laboratory were supplied to physicians for the treatment of leprosy. Assistance was given to the Bureau of Markets of the Department of Agriculture in regard to ergot standards for rye. The contents of two human stomachs of suspected poisoning were examined for the presence of methyl and ethyl alcohol. Samples of drugs were examined for the council of chemistry and pharmacy of the American Medical Association, the United States Compensation Commission, the Bureau of War Risk Insurance, Bureau of Mines, and International Health Board of the Rockefeller Foundation. Numerous memoranda were prepared in answer to inquiries of a pharmacological and toxicological nature from various sources.

DIVISION OF CHEMISTRY.

At the beginning of the fiscal year (July 1, 1920), Dr. Wm. Mansfield Clark assumed his duties as professor of chemistry in charge of the division.

New laboratories.—During the entire year much time has been occupied in equipping the new laboratories while carrying on such work as could be done in the available space.

Studies on oxidation-reduction.—Although oxidation and its counterpart reduction operate wherever vital processes are concerned and are of importance to a wide variety of problems varying from diabetes to disinfection by chlorine, there have been developed practically no quantitative methods for estimating the intensities of the oxidation-reduction process. The division has undertaken researches in this very difficult field with the hope of developing methods.

Chemical examination of arsphenamine and other arsenicals.—Arsenic has been determined in 1,046 samples of arsphenamine and neoarsphenamine. Fourteen samples of "silver salvarsan" have been examined. This work is part of the laboratory's control over the manufacture and sale of arsenicals.

Acid base equilibria of arsphenamine.—A study has been made of the hydrogen-ion concentrations of arsphenamine solutions containing various concentrations of added alkali. The results show that at the alkalinity of the blood there can be practically no acid or basic salt present.

Detection and estimation of toxic impurities in arsphenamine and neoarsphenamine.—Investigations made during the last fiscal year have demonstrated that the preparation known as neoarsphenamine can not be given a definite chemical formula. Since the composition of the preparation as supplied by reliable manufacturers varies, it has been necessary to develop suitable procedures for ascertaining the degree of variation.

Attempts to isolate the antineuritic "vitamine" in brewer's yeast.—It has previously been shown that the antineuritic "vitamine" in brewer's yeast may be adsorbed by fuller's earth. It has now been shown that this so-called activated fuller's earth retains its activity practically undiminished for five years. As described in Public Health Reports for April, 1921, there can be isolated from the fuller's earth an active silver complex which shows antineuritic properties. There have now been separated from the silver precipitate several crystalline preparations which are being tested for antineuritic properties and which are being subjected to chemical analysis.

Preparation of salt mixtures for pellagra experiments.—Cooperating with Surg. Joseph Goldberger in the studies upon the relation of diet to pellagra, the division prepared salt mixtures for 12,600 doses.

*Viability of *Bact. typhosum* and *Bact. coli*.*—A preliminary step in the study of factors influencing the disinfection of public water supplies was a study of the viability of *Bact. typhosum* and *Bact. coli* in water of different acidity or alkalinity and different temperatures. The mortality rate of each organism was found to be a function of both the alkalinity and temperature of the water.

Reconstructed milk studies.—Cooperating with the division of pharmacology in studies on reconstructed milk, the division of chemistry made determinations of fat, total solids, and protein on 132 samples.

Cooperation with the Office of Industrial Hygiene and Sanitation.—Cooperating with the Office of Industrial Hygiene and Sanitation.

tation, the division has made numerous analyses of gases, dusts, paints, oils, glazes, inks, etc., has studied compounds alleged to cause dermatoses, and has devised a method for preventing a dermatosis in the cancellation of coupons at the Register's Office of the Treasury Department.

Miscellaneous.—Twenty samples of water have been analyzed for one purpose or another. In addition the division made examinations of methylene blue, cream, milk, potassium iodide, glycerine, alkalized arsphenamine, and wood stain as an aid to other divisions of the service.

A memorandum was prepared on the probability of *Bact. typhosum* growing at a hydrogen-ion concentration likely to be found in salad dressing.

A source of error in the use of fluorescein to detect penetration of soils by sewage was detected and another bureau of the Government advised accordingly.

Glycerines were examined for their suitability in making vaccines and specifications proposed.

A method has been developed for determining the alkalinity of containers for smallpox vaccine.

An inspection of the ventilation of the Senate Chamber was made.

The division has supplied other divisions of the laboratory with standard buffer solutions and indicators and has outlined the application of hydrogen-ion methods in several researches.

VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS.

In connection with the enforcement of the law of July 1, 1902, governing the manufacturing, importation, and sale of viruses, serums, toxins, and analogous products, inspections were made of American and European establishments holding or applying for licenses.

The routine has consisted of the inspection of the plants of manufacturers with a view to determining their compliance with the standards which have been established as essential to the holding of licenses, and the examination of the products at the Hygienic Laboratory.

At the close of the fiscal year 41 establishments held licenses for interstate traffic in biologic products. Of these 32 were American concerns; 9 were foreign firms, distributed as follows: France 3, Switzerland 2, and Canada, England, Germany, and Italy 1 each. This is an increase of 3 establishments over the preceding fiscal year, a licensee increase of 8.8 per cent.

There are now 102 different biological products licensed for interstate traffic, a numerical increase of 9 over the fiscal year 1920, or 10 per cent.

Regulations for the control of arsphenamine, neoarsphenamine, and sodium arsphenamine were issued by the Secretary of the Treasury June 21, 1920, supplementing the regulations for the control of viruses, serums, etc., approved February 12, 1919. These regulations were prepared by a board composed of the surgeons general of the Army, Navy, and Public Health Service.

The laboratory investigations relating to viruses, serums, toxins, and analogous products are reviewed on pages 82 to 85.

CONFERENCE WITH STATE AND TERRITORIAL HEALTH AUTHORITIES.

This conference is convened by the Surgeon General of the United States Public Health Service under the act of Congress July 1, 1902. The nineteenth annual conference of State and Territorial health authorities with the United States Public Health Service was held in Boston, Mass., June 3-4, 1921.

Among the important questions relating to State and National public health matters discussed at the conference were the certification policy for water supplies used by all common carriers for drinking and culinary purposes in interstate traffic. The presence of sanitary engineers at the conference was especially desired in view of the fact that these questions are so closely related to their work. There were present representatives from States, sanitary engineers, and representatives of the service.

The program follows:

Malaria.

Cooperative demonstration work in rural sanitation.

Coordination of effort and promotion of efficiency in the field of sanitary engineering.

Problems of interstate health work:

Control of water supplies used in interstate traffic.

Control of the interstate spread of disease.

Foreign quarantine with relation to typhus.

Leprosy, hospital care in the United States.

Venereal diseases:

Suggestions for future work in venereal disease control by State boards of health and the United States Public Health Service.

Recommendation in regard to agencies for the control of venereal diseases.

Relation of lay activities to State health work.

Child hygiene.

Basic laws governing health authorities.

Registration area for morbidity reports.

Federal health policies.

Proposed legislation.—Discussion:

Reorganization of health activities of Government.

Physical education.

Maternity and infancy.

Hospitals.

Narcotic drugs.

Control of cancer.

Tuberculosis.

Social service in public-health work.

Tuberculosis, the necessity of developing local facilities in every community for diagnostic and treatment purposes. The tuberculosis ward in every general hospital a necessity.

Committee reports were made in regard to morbidity returns, regulations, rural sanitation, and trachoma, and a progress report of the board of excreta disposal was given.

REPRESENTATION AT MEETINGS OF SCIENTIFIC AND SANITARY ASSOCIATIONS AND CONGRESSES.

During the year service officers have attended a large number of annual and other meetings of scientific and sanitary associations and congresses. In most cases the representatives have given papers relating to public health, and in all have gained information of importance to the work of the service.

DISSEMINATION OF INFORMATION.

Information regarding the results of studies and investigations of the division has been disseminated by means of interviews and conferences with health authorities following particular studies within their jurisdiction, publications, other reports, lectures, and correspondence.

Interviews and conferences.—The results of investigations undertaken on the request of State and local authorities to meet an emergency are often given verbally as soon as obtained, with recommendations submitted for the improvement of the existing conditions, in order that remedial action may be immediately taken.

Publications.—Articles on health topics are prepared for the weekly Public Health Reports, in reprints of these reports, and for special publications, such as Public Health bulletins and Hygienic Laboratory bulletins. Many of the investigations referred to above are reported in these publications.

Other reports.—In many cases typewritten reports of investigations are furnished the authorities concerned.

Lectures.—In addition to addresses given at meetings of scientific and sanitary associations, popular lectures are given from time to time. By these lectures officers in the field bring to the attention of the public health activities of the service.

Correspondence.—A large number of replies are made to letters requesting information of a hygienic or public health nature.

DIVISION OF DOMESTIC (INTERSTATE) QUARANTINE.

The activities of this division during the past fiscal year to suppress epidemics and to prevent the interstate spread of disease included—(1) plague suppressive measures; (2) the carrying out of bureau policies for the prevention of epidemics by assisting State health departments in establishing and improving divisions of communicable diseases and sanitary engineering; (3) assisting the National Park Service of the Interior Department in providing adequate medical attention and improving the sanitary conditions of the national parks; (4) control of water supplies used for drinking and culinary purposes by interstate carriers; and (5) supervision over sanitary and health conditions on interstate carriers affecting the travel of persons and transportation of things.

PLAGUE SUPPRESSIVE MEASURES.

The operations for the control of plague in California have been continued, and squirrel-free zones have been maintained between the infected territory and the rat population of San Francisco, Oakland, and Berkeley. Rat-trapping measures were carried out in San Francisco.

Plague suppressive measures have been continued in New Orleans, Pensacola, Galveston, and Beaumont with such effective results that the spread of plague in the human population was quickly stopped and infection among rats has been either eliminated or reduced to a point where it is no longer a menace. These results were obtained with practically no panic and no loss to commerce and with little interference in the operation of carriers.

The plague-control measures in southern cities were so quickly instituted and so successfully prosecuted that it will be possible in the coming fiscal year to greatly reduce service activities. Unless new outbreaks occur the force at New Orleans will be reduced 50 per cent; at Galveston the work will be discontinued January 1, 1922; at Beaumont operations will be discontinued August 1, 1921, and at Pensacola, August 15, 1921.

PLAGUE SUPPRESSIVE MEASURES, NEW ORLEANS, LA.

During the fiscal year ending June 30, 1921, all plague suppressive measures in the city of New Orleans were conducted as in former years under the supervision of the United States Public Health Service, working in close cooperation with local authorities.

During the first three months of the seventh year of the campaign, on account of new plague foci being discovered in various towns located along the Mexican Gulf, the station was used as a supply base and as a training school for employees that were to engage in plague work at infected ports.

These extra activities caused neither diminution in effort nor change in policy as to the methods reinstituted in the late 1919 local campaign.

In all, 84 trained employees were sent from this station for duty elsewhere.

In addition, two experienced trappers were sent to Vera Cruz, Mexico, that were to be employed by the Mexican authorities in plague suppressive work at that point.

In order to ascertain to what extent, if any, the infection had migrated inland, it was deemed advisable to carry on rat surveys in various towns located along railroads with terminals in New Orleans. For this purpose Lake Charles, La., on the Southern Pacific Railroad; Baton Rouge, La., and Alexandria, La., on the Yazoo & Mississippi Valley Railroad; Bogalusa, La., on the New Orleans & Great Northern Railroad; Gulfport and Pascagoula, Miss., on the Louisville & Nashville Railroad, were selected. In all, 11,188 rats were trapped and sent to the New Orleans Laboratory for classification and examination. No suspicious lesions were found among any of these rodents.

The following is a tabulated account of the surveys made:

Name of city.	Period of trapping.	Number of rodents examined.	Rodents infected.
Lake Charles, La.	2 months 6 days.....	2,170	None.
Baton Rouge, La.	3 months 10 days.....	542	Do.
Alexandria, La.	1 month 24 days.....	649	Do.
Bogalusa, La.	1 month 17 days.....	950	Do.
Gulfport, Miss.	5 months 14 days.....	4,636	Do.
Pascagoula, Miss.	do.....	2,241	Do.
Total.....	1 year 7 months 25 days.....	11,188	Do.

Throughout the year but three cases of human plague were recorded, one in July and two in August, 1920, all resulting fatally. During the former fiscal year 15 cases of bubonic plague occurred, with 5 deaths, making a total of 18 cases to date; 10 recovered and 8 died.

GENERAL ORGANIZATION.

Passed Asst. Surg. M. S. Lombard remained in charge of the campaign assisted by Acting Asst. Surgs. R. E. Bodet and J. F. Roach. All laboratory measures remained under the supervision of Surg. C. L. Williams. A few modifications in the general plan of organization originally adopted in the previous fiscal year were made. These related to minor details found advisable to meet the local problems. The total force averaged 200 employees.

OUTGOING QUARANTINE.

Quarantine restrictions for the prevention of both the introduction and the exportation of plague by ships were strictly enforced throughout the year.

Cheerful compliance and full cooperation by the New Orleans Steamship Association, the various individual agents, masters, and others concerned has been the rule.

In December, 1920, on account of the great reduction in the percentage of rodent infection, the restrictions ordered in November, 1919, were modified to the following:

1. Vessels when in port, lying alongside wharves that have been repaired so as to make them rat-proofed to meet the service approval, were fumigated for the destruction of rodents not oftener than once in three months, and were not required to fend off or to use rat guards on connecting lines.

The wharves referred to are: Government warehouse, Pauline Street, Desire Street, Dumaine Street, Toulouse Street, Bienville Street, Poydras Street, Girod Street, Julia Street, Erato Street, First Street, and Sixth Street.

2. Vessels that at any time were lying alongside wharves that had not been repaired for rat proofing purposes were required to comply with all outgoing quarantine requirements, namely:

- (a) Fend off from the wharf a distance of not less than 4 feet.
- (b) Use of rat guards on all connecting lines.
- (c) Routine fumigation.

The wharves referred to are: Robin Street, Celeste Street, St. Andrew Street, and Harmony Street.

3. Vessels that were lying alongside structures which project entirely over water but still lack the required tight decking were required to fend off and rat guard, but were fumigated not oftener than once in three months.

These structures are: Sugar refinery, Louisa Street, Press Street, Mandeville Street, Governor Nicholl's Street, St. Joseph Street, Stuyvesant Docks, Westwego, and all wharves located on the Algiers side of the Mississippi River.

Vessels loaded with freight that had been stored, handled, or otherwise exposed to rat infestation at premises suspected or known to be plague infected where suppressive measures had not been instituted to insure safety, were fumigated after loading.

Whenever the circumstances surrounding the movement of ships permitted, a thorough and complete search for dead rats followed each fumigation. When practical, intensive trapping aboard ships was instituted, especially before fumigation. No plague-infected rodents were recovered subsequent to these measures on any vessel.

Tabulated operations of outgoing quarantine were as follows:

Number of vessels inspected for rat guards.....	22,694
Number of vessels fumigated with sulphur.....	0
Number of vessels fumigated with cyanide gas.....	1,544
Pounds of sulphur used.....	0
Pounds of cyanide used.....	103,334
Pints of sulphuric acid used.....	155,248
Total number of vessels fumigated, certificates issued.....	1,544
Clean bills of health issued.....	2,937
Foul bills of health issued.....	49
Number of vessels cleared.....	2,986
Total number of bills of health issued (including additional ports of call).....	6,908
Total number of vessels from domestic ports fumigated.....	128
Total number of vessels from foreign ports fumigated.....	1,416
Total amount of charges reported to collector of customs.....	\$17,781.30
Total number of rats killed by fumigation of vessels.....	3,101

¹ Each entry and each shifting of mooring counted.

By species:

<i>Mus norvegicus</i>	66
<i>Mus rattus</i>	1,263
<i>Mus alexandrinus</i>	1,624
<i>Mus musculus</i>	112
Wood rats.....	1
Miscellaneous.....	35
Number of fumigated rats found plague infected.....	0

LABORATORY.

The established practice of the previous year was followed in the laboratory. All rodents secured by the field forces were sent to the laboratory for classification and examination. Rodents were dissected and examined, and records kept of the location of each rodent received. A flea survey and the various procedures necessary for the confirmation of human and rodent infection were carried out.

To the end of the fiscal year there have been classified at the laboratory 396,840 rodents, of which 211,888 were examined for plague infection by species as follows:

Species.	Total number examined.	Male.	Female.
<i>Mus norvegicus</i>	163,161	87,088	76,073
<i>Mus rattus</i>	14,944	9,492	5,452
<i>Mus alexandrinus</i>	24,293	15,342	8,951
<i>Mus musculus</i>	653	253	400
Wood rats.....	2,695	1,366	1,329
Putrid.....	5,928		
Total.....	211,674	113,541	92,205

In addition to the above, the laboratory reported the receipt of the following animals, by species:

Muskrats.....	95
White rats.....	93
Banana rats.....	2
Rabbits.....	1
Guinea pigs.....	9
Other animals.....	14

Total animals, all species classified and examined, 211,888.

The total number of infected rodents (51), by species, were as follows:

Species.	Total.	Male.	Female.
<i>Mus norvegicus</i>	11	2	9
<i>Mus rattus</i>	11	5	6
<i>Mus alexandrinus</i>	18	8	10
Combination inoculations.....	11		
Total.....	51	15	25

It may be noted that in order of frequency the plague lesions observed were:

Subcutaneous injection, spleen lesions, liver lesions, buboes, and pleural effusions.

During the year 2,144 live rats were examined for fleas by species as follows:

<i>Mus norvegicus</i>	1,812
<i>Mus alexandrinus</i> and <i>rattus</i>	319
Wood rats.....	13

Average number of fleas per rat, 3.3.

When the United States Marine Hospital No. 14 was equipped with larger laboratory, the general laboratory work was transferred to that institution.

CONTINUED RODENT INFECTION.

Rodent plague, however, has continued to a surprising degree, which again exemplifies the peculiar tenacity of this infection and the stubbornness with which it resists efforts of eradication once it gains a foothold. This was well illustrated by the outbreak that occurred in January-February, 1921, in the 800 city square, South Fulton Street.

Plague infection in this section of New Orleans has periodically been discovered since September 9, 1915, being attributed to the non-rat-proof buildings.

For plague eradication purposes it appears that all rat-proofing, at least at plague foci, should be completed, preferably by the laying of concrete or any other impervious material in a manner that rodents may be "built out" and dark spaces eliminated so that "dormant infected places" may not be reached by these animals.

Throughout the year the percentage of infection has been less than 0.01 per cent. Of the infected rodents 13 were recovered as a result of fumigation; 8 were found dead, and 21 were secured by trapping. In addition, 9 combination inoculations gave positive findings.

Infected rats came from the following character of buildings:

Dwellings in yard.....	6
Food depots.....	28
Wharves.....	2
Open areas—dumps.....	2
Sheds or outhouses.....	2
Stables.....	2
Unknown (obtained by combination inoculation).....	9
Total.....	51

All foci were vigorously treated at the first appearance of infection according to indication by fumigation with cyanide gas, summary removal of rat harborage, initiation or completion of the work for rat-proofing, spraying with kerosene emulsion, or intensive trapping. In general, one or more or all of these procedures sufficed to remove all traces of infection from the premises.

Notwithstanding, there has been a marked reduction in the number of rodent cases, indicated comparatively as follows:

During the fiscal year ending June 30, 1920:	
Number of rodents examined.....	260,615
Number of rodents found plague infected.....	569
During the fiscal year ending June 30, 1921:	
Number of rodents examined.....	211,888
Number of rodents found plague infected.....	51

TREATMENT OF FOCI.

As a routine measure in human plague, both the patient's residence and his place of employment were immediately fumigated with cyanide gas for rodent and flea destruction. Premises from which positive rats were recovered were immediately inspected upon receipt of such report from the laboratory. The treatment of the focus depended upon the character of the surroundings. If the premises consisted of open areas, little was done other than a general clean-up, elevation of any material stored thereon, intensive trapping and poisoning when practicable.

Whenever found advisable, the ground area was sprayed with kerosene mixture. In all, 374 gallons of kerosene emulsion was sprayed over 3,559 square yards of ground area.

Buildings, such as wholesale groceries, warehouses, rice mills, etc., to which human or rodent plague was traced were, as soon as possible, fumigated with cyanide gas for the destruction of fleas and the remaining rats. Intensive trapping was immediately instituted in all cases.

Poisoned bait was not distributed in localities in which there was danger of poisoning human beings or live stock. In all, 182,730 pieces of poison were placed.

The rat-proofing status of all buildings in infected areas was carefully investigated, and such defects as found were ordered repaired.

Whenever rat harbors were suspected or determined to exist under non-rat-proofed structures, such as old broken floors, they were treated by exposing the rat arborage. In this work, the demolishing squad and property owners removed 14,597 square yards of planking.

A summary of fumigation operations at foci of infection follows:

Number of buildings fumigated with cyanide gas.....	17
Buildings fumigated on account of human plague.....	3
Buildings fumigated for rodent foci.....	4
Buildings adjoining rodent foci fumigated.....	8
Buildings fumigated for the destruction of excessive rodent population.....	2
Total cubic feet space fumigated.....	5,408,357
Pounds of cyanide used.....	1,730
Pints of sulphuric acid used.....	2,595
Number of rodents recovered after fumigation.....	343
By species:	
<i>Mus norvegicus</i>	9
<i>Mus rattus</i>	65
<i>Mus alexandrinus</i>	77
<i>Mus musculus</i>	192
Number of plague rodents recovered by fumigation.....	13

TRAPPING.

The destruction of rats and the location of infected areas in a community depends principally on trapping. The extent and progress of the epizootic can only be determined by effective trapping correlated with laboratory examination. For this reason, an efficient trapping force is of utmost importance in antiplague campaigns, and no effort has been spared in endeavoring to maintain a perfect organization.

Only minor changes have been made in the routine methods employed in former years beyond increased supervision.

Throughout the fiscal year a daily average of 120 trappers, under 16 foremen, were at work handling 15,405 snap traps, 613 cages, 218 game traps, and 2,989 mouse traps. The average number of traps in daily use was 19,225.

The total number of rats trapped for the fiscal year just ended was 380,417, of which 4,110 were trapped on vessels, 16,570 were trapped on wharves, and 359,727 were trapped on other premises. Not included in the total were 11,453 rodents found dead by the trappers.

Rodents recovered by the trappers by species were:

<i>Mus Norvegicus</i>	155,152
<i>Mus rattus</i>	13,088
<i>Mus alexandrinus</i>	21,239
<i>Mus musculus</i>	182,276
Wood rats.....	2,663
Unclassified.....	143
Putrid.....	5,856

Rodents found dead by species were:

<i>Mus norvegicus</i>	8,950
<i>Mus rattus</i>	895
<i>Mus alexandrinus</i>	1,264
<i>Mus musculus</i>	308
Wood rats.....	11
Unclassified.....	25

The rat catch per month and the average daily rat and mouse catch per man is given in the following table:

Month.	Trapping days.	Number of rats.	Rats per man per day.	Number of mice.	Mice per man per day.
1920.					
July.....	3,139	15,444	4.92	8,896	2.83
August.....	4,614	18,181	3.94	16,631	3.60
September.....	2,786	15,275	5.48	15,686	5.63
October.....	2,272	15,607	6.87	19,297	8.49
November.....	2,621	13,645	5.21	17,056	7.28
December.....	3,024	13,442	4.45	18,464	6.11
1921.					
January.....	3,038	13,029	4.35	16,072	5.29
February.....	2,819	13,753	4.88	12,562	4.46
March.....	3,352	18,899	5.40	14,681	4.38
April.....	3,248	22,300	6.87	16,153	4.67
May.....	3,393	23,167	6.82	15,859	4.61
June.....	3,218	22,353	6.94	13,724	4.26
Total.....	37,524	203,095	5.46	185,081	4.93

THE CITY DUMPS.

In its midst New Orleans has several comparatively large areas which are used as public dumping grounds, commonly called the "city dumps." While these areas within the city proper are not used for the dumping of, strictly speaking, "garbage," yet enough material attractive to rats arrive at these points to furnish an abundant food supply. The miscellaneous material dumped creates rat harborage. With these conditions the destruction of rats in spite of

intensive trapping, poisoning, and limited burning has been rendered difficult.

The underground public works (sewers, covered canals, etc.) have presented an equally difficult problem on account of unobstructed runways, the rat harborage in these places being facilitated by the woodwork installed therein. Of the total infected rats found during the present campaign in the city of New Orleans, 18 per cent were recovered from, in, or near the city dumps.

The proper city officials were notified of these conditions and specific recommendations made. Various schemes to make possible the abandonment of dumping at these areas, ranging from the simplest possible method to the most elaborate and expensive systems of garbage disposal, were suggested. This office has on various occasions offered active cooperation in bringing about a prompt and satisfactory solution.

The city engineer, after a careful study of the situation in February, 1921, submitted to the commissioner of public property a carefully prepared report giving details of a plan to remedy the dump situation, which met with the approval of all concerned. It is hoped that the recently elected city administration will soon find it possible to institute an effective method for the sanitary control of this nuisance.

RAT-PROOFING.

The reconstruction of premises for the elimination and the prevention of rat harborage continued throughout the year. In infected areas inspectors were required to make reinspections of all premises in the immediate vicinity to detect defects of rat-proofing and locate rat harbors.

Legal action was taken against violators of any of the provisions of the rat-proofing law. Of 597 legal cases, 287 affidavits were withdrawn by the service on account of compliance before trial, 6 violators were convicted, and 304 cases are still pending.

At the end of the fiscal year the status of the sanitary work along the river front was as follows:

The Desire Street, First Street, and the Sixth Street wharves were completed or reconstructed during the year, with work in progress at the Fourth Street wharf. Robin Street, Celeste Street, St. Andrew Street, and Harmony Street wharves, however, still remain not rat-proofed. It is expected that work will start soon for the rat proofing of the Celeste Street wharf.

A summary of rat-proofing operations follows:

Notices served.....	5, 828
New buildings inspected.....	728
Number of premises inspected.....	46, 584
Number of premises abated.....	4, 999
By elevation.....	231
By marginal wall.....	635
By concrete floor and wall.....	1, 021
By minor repairs.....	2, 797
Total buildings rat-proofed.....	4, 684
Buildings demolished.....	315
Total buildings rat-proofed to date.....	169, 223

Character of structures.	Complete rat-proofed.	Work started.	Total.	Square yards of concrete laid.	Linear feet of concrete wall.	Elevated.	Cost.
Main buildings, class A.....	440	203	643	157,639	148,234	.....	\$1,866,238
Main buildings, class B.....	2,449	864	3,313	.....	15,139	126	62,939
Sheds and outhouses, class A.....	581	293	874	19,530	25,642	.....	84,232
Sheds and outhouses, class B.....	1,529	422	1,951	.....	12,515	105	33,515
Total.....	4,999	1,782	6,781	177,169	201,530	231	12,046,924

¹ New construction included.

PLAGUE SUPPRESSIVE MEASURES, PENSACOLA, FLA.

The plague suppressive measures at Pensacola, Fla., in the past fiscal year have been carried out under the direction of Passed Asst. Surg. R. R. Spencer.

On June 11, 1920, the local quarantine officer at Pensacola, Fla., reported by wire a suspected case of bubonic plague to the Surgeon-General of the United States Public Health Service. Since bubonic plague had never been known to occur in Pensacola before, it was of great sanitary importance to determine whether the infection had been contracted locally or whether the patient had brought it in from some plague-infected port such as Vera Cruz. A careful history of the case was therefore taken and the fact brought out that the patient had lived all his life in Pensacola, and had not left the city or been aboard a ship in the harbor for the past six months. This fact, together with the occurrence of a second case on June 15, and a third on June 18, appeared to be ample evidence that the human infection was coming from local rodent plague foci.

In the meantime the Public Health Service Laboratory car "Hamilton" which was being used in a rodent survey at Mobile, Ala., was ordered to Pensacola with its entire equipment and trained personnel. The car arrived in Pensacola on June 17, and facilitated the immediate institution of plague suppressive measures.

Likewise, the cooperation extended by the State board of health was largely instrumental in rapidly suppressing the epidemic.

A review of the city death records revealed the fact that a negro boy, age 16, had become suddenly ill on May 31, and died two days later.

Further investigation indicated that the case had been one of plague. The epidemic, therefore, dates from May 31, 1920. The tenth and last case of the epidemic occurred August 31, just three months after the first case and two and one-half months after the introduction of plague suppressive measures.

Each human case was quarantined in the home, care being taken that the patient was placed in a room free from rats and fleas and that all such pests were eliminated as far as possible around the premises. No attempt was made to isolate all patients in one building because the city of Pensacola possessed no adequate isolation hospital and because the bubonic form of plague is practically noncontagious from man to man where there are no suctorial insects.

LABORATORY OPERATIONS FROM JUNE 19, 1920, TO JULY 1, 1921.

The following rodents were classified and examined in the laboratory:

<i>Mus Norvegicus</i>	10,331
<i>Mus alexandrinus</i>	3,664
<i>Mus rattus</i>	685
<i>Mus musculus</i>	19,873
Wood rats.....	24
Putrid and unclassified.....	1,299
Total.....	35,876
Number of rodents found dead and putrid by species:	
<i>Mus norvegicus</i>	998
<i>Mus alexandrinus</i>	159
<i>Mus rattus</i>	55
<i>Mus musculus</i>	190
Total.....	1,312
Number of rats found infected with rat leprosy.....	8
Number of plague-infected rodents by species:	
<i>Mus norvegicus</i>	35
<i>Mus alexandrinus</i>	1
Total.....	36

Flea survey, Pensacola, Fla., July 1, 1920, to July 1, 1921.

Largest number of fleas found on one rat.....	211
Largest number of flea species found on one rat.....	5
<i>Mus norvegicus</i> examined for fleas.....	683
Number of fleas recovered from <i>Mus norvegicus</i>	7,957
Average number of fleas per <i>Mus norvegicus</i>	11.6
Number of <i>Mus alexandrinus</i> and <i>rattus</i> examined for fleas.....	69
Number of fleas recovered from <i>Mus alexandrinus</i> and <i>rattus</i>	646
Average number of fleas per <i>Mus alexandrinus</i> and <i>rattus</i>	9.3
Total number of rats examined for fleas.....	752
Average number of fleas per rat.....	11.3

Fleas classified by species.

<i>Loemopsylla cheopis</i>	4,640
<i>Pulex irritans</i>	1,989
<i>Ctenocephalus canis or felis</i>	1,101
<i>Ceratophyllus faciatus</i>	657
<i>Ctenopsyllus musculi</i>	216
Total.....	8,603

TREATMENT OF RODENT FOCI.

Whenever a rat, upon examination in the laboratory, was diagnosed as plague, an immediate inspection was made of the premises where it was trapped. Such location was considered as a plague focus and usually demanded immediate attention. It was customary to treat foci either by demolition and destruction of rat harborages, by fumigation with cyanide gas, by the institution of rat-proofing, by intensive trapping, by the use of a pulicide emulsion as a spray for ground areas, or by two or more of these measures.

SUMMARY OF OPERATIONS OF FUMIGATION AND DEMOLITION SQUAD.

Fumigation of rodent foci was carried out only when a close inspection indicated that rats would be killed in this way. Not all foci

were so treated, but some other buildings were fumigated when a large number of rats were certain to be recovered.

Pounds of cyanide used.....	1, 228
Pints of sulphuric acid.....	1, 854
Number of buildings fumigated.....	21
Number of rodents recovered after fumigation.....	317
Number of plague rodents recovered by fumigation.....	3
Number of houses demolished.....	7
Number of square feet sprayed with pulicide.....	13, 650
Number of truck loads of trash and débris hauled to city dumps.....	280

TRAPPING.

Trapping operations began on June 18, 1920. The entire city was divided into trapping areas of about four blocks each. Trappers were required to work within their own districts, to carefully tag each rat caught, to place them immediately in a purse string canvas bag or bucket with tight-fitting cover, and to dip all rats in oil before entering the laboratory, this last in order to kill fleas.

Wire cage traps, snap traps, and steel traps were the varieties used throughout the year. Trappers were closely supervised and every detail carried out to make their work efficient. Each trapper was provided with a complete outfit. Besides this equipment, some of the trappers used terrier dogs and trench spades for the destruction of Norway rats.

The rat catch per month and the average daily rat and mouse catch per man from June 19, 1920, to July 1, 1921, is given in the following table:

Month.	Trapper days.	Number of rats.	Average number of rats per man per day.	Number of mice.	Average number of mice per day per man.
1920.					
June.....	295	1, 789	6.06	809	3.3
July.....	830	2, 370	2.8	2, 449	2.9
August.....	604	2, 132	3.5	1, 510	2.5
September.....	437	985	2.2	1, 303	2.9
October.....	465	1, 003	2.1	1, 998	4.2
November.....	403	715	1.7	1, 273	3.1
December.....	347	571	1.6	1, 326	3.7
1921.					
January.....	350	567	1.6	1, 366	3.8
February.....	336	790	2.3	935	2.7
March.....	360	725	2.01	747	2.07
April.....	345	807	2.3	2, 095	6.0
May.....	372	722	1.9	2, 291	6.0
June.....	360	554	1.5	2, 463	6.8
Total.....	5, 504	13, 730		20, 565	

THE PROTECTION OF FOOD FROM RODENTS.

The protection of food from rodents is an effective supplementary method of deratization when universally carried out. The very first step in this direction is the passage of an adequate garbage ordinance, especially when the collection and disposal of garbage is lax. Such ordinance was passed in Pensacola on July 6, 1920, and in order to

insure better collection and disposal, extra wagons were put in commission by the city authorities. Unfortunately, garbage was not collected in certain outlying districts of the city and the city incinerators have never been large enough to handle the volume that was collected. There was no way of estimating accurately the degree of success obtained through the protection of food from rodents, but it was noticed that wherever individuals made even indifferent attempts to cut off the rodent food supply around their premises, rats were trapped or poisoned very much more readily.

POISONING OPERATIONS.

The danger of poison to children and domestic animals prevented its use around premises by the Public Health Service. However, in the latter part of the campaign 41,877 pieces of poison bread were placed on the city dumps, in gullies, ravines, and other open spaces where there was considerable undergrowth. The preparation used was an arsenic paste. It was not considered advisable to use poison extensively in the early part of the campaign as some plague infected rodents might be killed and not recovered, and in this way a few rodent plague foci be overlooked. In the latter part of the campaign, however, its use in known infected areas could not greatly interfere with the localization of rodent plague foci. Within a few days after the distribution of the poison, about 24 rats were found dead. A larger number would probably have been recovered had not rat-proofing and trapping been going on for some months.

RAT-PROOFING.

Legal proceedings.—The following ordinances were passed by city on the dates given:

Rat-proofing ordinance, July 8, 1920.

Garbage ordinance, July 6, 1920.

Ordinance to prevent egress of rodents from vessels to wharves and docks, July 12, 1920.

Court cases.

Total affidavits filed	172
Number of court days	10
Cases dismissed by service	98
Cases tried	6
Found guilty	5
Under advisement	1
Appealed	2
Favorable decision	1
Unfavorable decision	1
Amount fines imposed	\$200
Cases continued by court:	
Promise to comply	16
Absence of attorney	5
Working	14
Absence of defendant	20
Poverty	1
Under advisement	1
Total continuances	57
Number of cases pending	69

RAT-PROOFING BY WIRE FLOOR.

Only 28 food depots were rat-proofed by wiring over the existing floor and covering the wired area with another wood floor 2 inches thick. In all of these cases it has been the policy, first, to secure elevation, as it is felt that an elevated building with all double walls filled with brick laid in cement mortar is far better rat-proofing than surrounding the structure with an area wall, with dry rot and its attendant evils almost certain to result. Among the class A property which has not fully complied with the ordinance there are a few very small stores in the outlying districts which were rat-proofed incompletely by elevation and filling of the double walls with brick.

FREIGHT INSPECTION.

In order to prevent rodent infection from spreading by means of overland freight, inspectors were immediately stationed at the outbound freight sheds of all railroads. Their duty consisted in supervision of car rat-proofing and inspection of all outbound freight. Private firms shipping in carload lots were also subject to this inspection. But three rats were found by inspectors in 5,263 cars examined. This work was discontinued after December 31, when the epidemic was well in hand and all outbound freight sheds had been rat-proofed.

The tabulation below gives the rat-proofing data for the fiscal year :

Method.	Number.	Concrete.	Wall.	Cost.
		<i>Sq. yds.</i>	<i>Feet.</i>	
Major repairs.....	234	35,290	28,673	\$164,824
Minor repairs.....	56			4,714
Demolished.....	16			1,418
Wire floor.....	23		298	25,370
Discontinued.....	34			82
Miscellaneous "A".....	18	2,160	424	7,045
Total class "A" main buildings.....	386	37,450	29,395	203,453
Elevation.....	71			7,554
Area wall.....	109		12,808	13,913
Minor repairs.....	3,359			93,479
Demolished.....	54			2,464
Wharves.....	3		210	6,810
Miscellaneous "B" minor repairs.....	174			7,559
Elevation.....	1			300
Area wall.....	33		4,164	4,731
Demolition.....	5			225
Total class "B" main buildings.....	3,809		17,182	137,035
Total main buildings "A" and "B".....	4,195		46,577	340,488
Outbuildings:				
Major repairs.....	111	2,205	4,191	10,515
Minor repairs.....	8			95
Stables rat-proofed.....	32	1,136	1,388	4,857
Demolished.....	35			208
Total class "A" outbuildings.....	186	3,341	5,579	15,675
Elevation.....	976			10,393
Area wall.....	129		6,611	6,709
Minor repairs.....	93			740
Demolition.....	94			1,035
Floor removal.....	3,453			7,963
Total class "B" outbuildings.....	3,745		6,611	26,840
Total outbuildings "A" and "B".....	3,931	3,341	12,190	42,515
Grand total.....	8,126	40,791	58,767	383,003

RECAPITULATION.

Square yards concrete floor laid-----	40,791
Linear feet area wall installed-----	58,767
Linear feet flashing installed-----	6,901
Square yards planking removed-----	60,414
Square yards wire floor installed-----	15,388
Average cost per food depot-----	\$533.49
Average cost dwellings-----	\$32.67
Average cost structures other than food depots or dwellings-----	\$113.98
Average cost of outbuildings-----	\$10.83
Number of food depots-----	414
Number abated-----	368
Per cent abated-----	88.8
Per cent noncompliant-----	3.8
Number of structures other than food depots-----	6,868
Number abated-----	3,809
Per cent abated-----	56.6
Per cent noncompliant-----	20.4
Average number of abatements per week-----	80.6
Total number of premises abated-----	4,195
Average cost per premise-----	\$91.06
Total cost of rat-proofing-----	\$383,003.00

PUBLICITY.

Briefly, publicity consisted of special articles for the daily papers, lantern slides for the moving-picture houses, window demonstrations of plague suppressive measures in the business section of the city, distribution of handbills to housewives and other publicity connected with the inauguration of a "Clean-Up Week" during March, 1921. The salient facts upon which emphasis was at all times made, were (a) that plague is primarily a disease of rodents; (b) that plague is carried from rats to man by fleas; (c) that rats and fleas thrive in filth; (d) that plague is, therefore, indirectly dependent upon filthy conditions; (e) that cleanliness and sanitation will prevent plague, as evidenced by the fact that it seldom, if ever, develops in the better and more sanitary residential districts of a community; (f) that it is within the power of every individual householder and property owner to rid his premises of rats and fleas if he will; (g) that rats are dependent for their existence upon the carelessness with which people permit food, garbage, or animal feed to become available to them; (h) that the Public Health Service will gladly instruct and assist in ridding premises of these pests.

PLAGUE SUPPRESSIVE MEASURES AT GALVESTON, TEX.

On June 16, 1920, a human case of bubonic plague was reported at Galveston, Tex. On June 21, 1920, the first rodent case was discovered. On June 20, 1920, the United States Public Health Service took charge of plague eradication measures at Galveston, and since that date the work has continued under service supervision. The last case of human plague was reported November 14, 1920, and of rodent plague on May 2, 1921. Eighteen human cases, with 12 deaths, and 68 rodent cases were found since June 16, 1920. Of the rodent cases, 67 occurred in the *Mus norvegicus* and one in the *Mus rattus*.

The methods used in combating the epidemic were wrecking, trapping, freight-car fumigation, house fumigation, and rat-proofing.

WRECKING.

During the last week in September active wrecking operations were begun and a total of 1,043,277 square feet of planking were removed from or near the ground. The result was a marked and prompt reduction in both human and rodent cases. The last rodent case in 1920 was found on December 2, 1920, after removing the wood floor from a building where five positive rats had been found. The next case of rodent plague was not discovered until May 2, 1921. The importance of the wrecking operations may be better understood when it is explained that a large percentage of the residences of Galveston, known as high-raised cottages, are really one-story houses that have been elevated 6 to 8 feet and wood floors placed in the basement in close proximity to the ground. The removal of those floors therefore resulted in the elimination of a large number of rat harbors.

Trapping operations were carried on by the usual methods, using snap traps, cage traps, and steel traps. Poison was used to a limited extent along the riprap at the sea wall. The table appended below shows the trapping activities by months:

Month.	Trapping days.	Number of rats.	Rats per day per man.	Number of mice.	Mice per day per man.
1920.					
June.....	266	532	2.0	65	0.24
July.....	454	9,451	20.8	1,471	3.2
August.....	1,275	12,257	9.6	2,287	1.7
September.....	810	4,556	5.6	2,723	3.3
October.....	829	8,469	10.2	3,989	4.8
November.....	802	5,929	7.3	3,650	4.5
December.....	807	4,726	5.8	2,874	3.5
1921.					
January.....	743	3,999	5.3	3,003	4.1
February.....	773	2,767	3.5	2,841	3.8
March.....	755	2,492	3.3	3,319	4.3
April.....	721	2,153	2.9	3,334	4.6
May.....	728	1,742	2.3	3,437	4.7
June.....	744	1,627	2.1	3,212	4.3
Yearly.....	9,707	60,700	6.2	36,205	3.7

Total number of rodents found dead..... 49

By species:

<i>Mus norvegicus</i>	27
<i>Mus rattus</i>	9
<i>Mus alexandrinus</i>	13
<i>Mus musculus</i>	0
Wood.....	0

Total number of rodents trapped on wharves..... 9,078

Total number of rodents trapped on vessels..... 1,717

Total number of rodents trapped on premises..... 82,383

FREIGHT CAR FUMIGATION.

A representative of the State board of health was detailed to fumigate and inspect freight cars. After December 15, 1920, this work was discontinued.

Total number of freight cars inspected..... 17,280

Total number of freight cars fumigated..... 478

Pounds of cyanide used..... 697

Pints of sulphuric acid used..... 1,181

HOUSE FUMIGATION.

Where rodent or human cases were found buildings were fumigated, hydrocyanic acid gas being the fumigant employed:

Number of buildings fumigated.....	60
Pounds of cyanide used.....	3,882
Pints of sulphuric acid used.....	5,898
Sacks used.....	186
Number of plague rodents recovered by fumigation.....	2

RAT-PROOFING.

The rat-proofing of buildings has been pushed vigorously, particularly since January 1, 1921. The methods employed were chain walls, concrete floors, and elevation. The rat-proofing of dwellings and other class B properties by chain walls was discouraged as far as possible. The table below shows the number of buildings abated and the methods employed:

	Class A.	Class B.	Outhouses, sheds, cisterns.	Stables.
Abated.....	74	1,916	1,772	41
Elevated and concrete wall fill.....	10			
Elevation previously O. K., minor repairs.....		1,727	1,209	
Elevated.....		171	321	
Concrete floor and chain wall.....	41		63	19
Chain wall and concrete floor previously O. K., minor repairs.....	23		100	5
Chain wall.....		15		
Linear feet of chain wall.....	2,436	1,323	2,938	418
Square yards of concrete floors.....	4,721	1,165	1,019	154
Linear feet of concrete wall fill.....	4,401			
Demolished.....		3	79	17
Cost.....	\$29,841	\$64,847.50	\$21,968	\$1,068
Total, \$117,724.50				

Notices were served on 11,084 properties, and the number of buildings completed, as disclosed by the table, may appear relatively small in proportion to the time consumed, but a larger number of properties have been completed, with the exception of minor details, than have been abated.

LABORATORY.

Ninety-eight thousand six hundred and thirty-four rodents have been received and 93,755 were examined at the laboratory, as follows:

Species.	Number received	Number examined.	Number suspicious.	Number infected.
<i>Mus norvegicus</i>	33,531	33,531	136	67
<i>Mus ratus</i>	2,647	2,647	1	1
<i>Mus alexandrinus</i>	3,793	3,793		
Putrid.....	2,219	2,101		
Wood.....	19,868	19,868		
<i>Mus musculus</i>	36,568	36,568		
Other rodents.....	8	8		
Total.....	98,634	93,755	137	68

Flea survey.

	1920						1921						Total.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
Norway.....	3	.....	.....	2	4	.....	.....	.....	5	13	6	2	35
Total number fleas.....	43	.....	.....	32	32	.....	.....	.....	77	100	96	46	426
L. Cheopis.....	43	.....	.....	32	21	.....	.....	.....	63	81	94	46	380
C. Fasciatus.....	.....	.....	.....	.....	11	.....	.....	.....	.....	.....	.....	.....	11
C. Musculi.....	.....	.....	.....	.....	.....	.....	.....	.....	14	19	1	.....	34
P. Felis.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Rattus.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	2	.....	4
Total number fleas.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	27	.....	50
L. Cheopis.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	27	.....	50
C. Fasciatus.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
C. Musculi.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alexandrinus.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	2	3	7
Total number fleas.....	.....	.....	.....	.....	6	.....	17	.....	.....	.....	54	88	165
L. Cheopis.....	.....	.....	.....	.....	5	.....	4	.....	.....	.....	54	88	151
C. Fasciatus.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
C. Musculi.....	.....	.....	.....	.....	.....	.....	13	.....	.....	.....	.....	.....	13
Total number rats.....	3	.....	.....	2	6	.....	1	.....	5	14	10	5	46
Total number fleas.....	43	.....	.....	32	38	.....	17	.....	77	123	177	134	641
L. Cheopis.....	43	.....	.....	32	26	.....	4	.....	63	104	175	134	581
L. Fasciatus.....	.....	.....	.....	.....	12	.....	.....	.....	.....	.....	.....	.....	12
L. Musculi.....	.....	.....	.....	.....	.....	.....	13	.....	14	.....	1	.....	47
P. Felis.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Fleas per rat.....	14.3	.....	.....	16	6.3	.....	17	.....	15.4	8.8	17.7	26.8	13.9

OUTGOING QUARANTINE.

Outgoing quarantine transactions were under the supervision of the medical officer in charge of plague eradication measures at Galveston. Until January 15, 1921, vessels were required to fumigate every trip in order to obtain a clean bill of health. Subsequent to that time fumigation was required every two months, and after March 1 every three months. Hydrocyanic acid gas was the only fumigant employed.

The appended table shows the number of rodents obtained by fumigation of vessels:

Species.	Total number obtained.	Total number fumigated rodents found infected.
<i>Mus norvegicus</i>	67	0
<i>Mus alexandrinus</i>	1,263	0
<i>Mus rattus</i>	2,194	0
<i>Mus musculus</i>	38	.....
Wood.....	0	0
Putrid.....	0	0

The table below shows the number of vessels that have entered and cleared, together with the class of bill of health issued:

Number of vessels entered.....	1,266
Clean bills of health issued.....	1,712
Foul bills of health issued.....	196
Bills of health including additional ports of call.....	3,063
Number of vessels cleared.....	1,908
Number of vessels fumigated.....	808
Pounds of cyanide.....	56,254½
Pints of acid.....	86,035

The State dock regulations were enforced under the direction of the medical officer in charge of plague eradication measures. Vessels were required to breast off 8 feet from the docks, to properly guard all lines and to keep gang planks raised between sunset and sunrise. In the case of several vessels the captains were fined for failure to comply.

An effort has been made at all times to work in cooperation with State and local health authorities and those officials have rendered valuable assistance in many and diverse ways.

In determining the most satisfactory manner of rat-proofing the docks at Galveston considerable difficulty was encountered. The bulkheads are constructed of creosoted timbers and are 10 inches in thickness at the narrowest point. The present location of the docks was formerly covered with water. By gradual fill the elevation has been raised to the present point. The warehouses, with the exception of four docks, are constructed of wood. The fill behind the bulkheads is still settling. On account of that fact, it has been decided that vitrified brick grouted in concrete will make the most satisfactory and economical floor.

PLAGUE-SUPPRESSIVE MEASURES AT BEAUMONT, TEX.

All plague suppressive and eradication measures in the city of Beaumont were conducted under the supervision of the United States Public Health Service, with Passed Asst. Surg. H. F. White in charge, in close cooperation with the State and city authorities. The following measures were instituted for controlling both human and rodent plague:

1. Fumigation of all buildings and premises where plague-infected rodents were captured or human plague cases occurred.
2. Trapping operations over the entire city, wharves, and ships.
3. Examination of rodents for plague infection and such other work as required in the service laboratory.
4. Removal of all wood floors and rat harborages in and above each foci where human plague cases occurred or infected rodents were found.
5. Inspection of all buildings and premises in the city in regard to rat-proofing same.

HUMAN PLAGUE.

The first case of human plague was reported and officially recognized on June 19, 1920. It was reported to the United States Public Health Service on June 26, 1920. Fourteen cases of plague in all were found, with 8 recoveries and 6 deaths. The last case of human plague was reported on August 23, 1920.

ORGANIZATION.

The plan of organization was modeled after the service organization in New Orleans during the campaign of 1914, 1915, and 1916. A total force of 208 men were employed during the first few months of the campaign; this number was gradually reduced. At the end of the fiscal year, June 30, 1921, there were at work in the city of

Beaumont a force of 86. The plan of work included both general and special measures. Under general measures—legislation, publicity, rodent destruction, laboratory examination, rat-proofing, the proper collection and disposal of garbage, and the application of quarantine measures, maritime, inter and intra state. Under special measures—fumigation of all foci with hydrocyanic acid gas for the destruction of fleas and rodents and the removal of rodent harborages in and about each focus of infection.

PUBLICITY.

No attempt was made to give the situation undue publicity, but it was felt best to advise interested parties fully and frankly of the situation. Meetings were held with city and State officials, representatives of railroads, rice mills, business interests, and medical societies, and other organizations, and the situation discussed freely. The organizations promised full support and active cooperation. A special meeting was held in the city hall with city officials and business men on July 13, 1920, for the purpose of enacting a rat-proofing ordinance. After some discussion, this ordinance was passed. The frankness of the city officials and the press operated more than any other feature in establishing confidence in the neighboring States and counties that all precautions were being taken to prevent the spread of this disease.

OUTGOING QUARANTINE.

With the appearance of plague, the following maritime quarantine restrictions were instituted:

All vessels mooring at the wharves were required to fend off 6 feet.

All mooring lines were required to have properly placed rat guards.

All gang planks were required to be raised at night.

All vessels bound for other ports in the United States and foreign ports were required to be fumigated for rodent destruction prior to departure.

Number of vessels inspected for rat guards, 1,942.

OVERLAND QUARANTINE.

To prevent the spread of infection through outbound freight cars, the following measures were enforced:

All cars not rat-proofed were required to be rat-proofed before loading.

Buildings not rat-proofed were ordered to discontinue the handling of outbound freight or else rat-proof at once.

Number of cars inspected for rat-proofing, 9,874.

LABORATORY.

All rodents secured by the trappers were sent to the laboratory for classification and examination. Rodents were dissected and examined and a record kept of the location of each rodent received. A flea survey and various procedures necessary for the confirmation of human and rodent infection were carried out. During the fiscal

year there have been classified and examined at the laboratory 96,272 rodents, by species as follows:

<i>Mus norvegicus</i>	29,901
<i>Mus rattus</i>	1,425
<i>Mus alexandrinus</i>	10,970
<i>Mus musculus</i>	29,153
Wood rats	22,271
Putrid	2,531
Total	96,251

In addition to the above the following animals were received by species:

Muskrats	3
White rats	3
Rabbits	5
Guinea pigs	1
Opossums	9

Total number of animals, all species, classified, received, and examined, 96,272.

Total number of infected rodents, 122, by species as follows:

<i>Mus norvegicus</i>	119
<i>Mus alexandrinus</i>	3

From July 1, 1920, to June 30, 1921, 37 live rats were examined for fleas, by species as follows:

<i>Mus norvegicus</i>	36
<i>Mus alexandrinus</i>	1
<i>Mus rattus</i>	9
<i>Mus musculus</i>	0
Muskrats	0
Wood rats	0

Intensive trapping has been carried on at all times, and it seems safe to say that all rat harborages have been removed and the sources of infection eliminated. Infected rats came from the following character of buildings:

Dwellings, inside	23.
In yards	48

Total	71
-------------	----

Food depots	18
Dumps	4
Wharves	1
Sheds	7
Stables	2
Miscellaneous buildings	19

Total	122
-------------	-----

Of the total number of infected rodents 31 were found dead, and of the first 50 infected rodents 16, or 33½ per cent, were found dead, thus the high percentage of infection at the start of the campaign.

INFECTED FOCI.

There were many foci in which a large number of infected rodents were found. In locations where human plague cases or where infected rodents were trapped or found, the buildings were imme-

diately fumigated with cyanide gas for rat and flea destruction. Intensive trapping operations were instituted and the places were inspected in regard to rat-proofing. All rat harborages were removed. A summary of fumigation operations of the foci is as follows:

Number of buildings fumigated with cyanide gas-----	114
Number of buildings fumigated for rat destruction-----	114
Pounds of cyanide used-----	5, 678
Pints of sulphuric acid used-----	8, 521
Cubic feet of space fumigated-----	28, 849, 839
Number of rodents recovered after fumigation by species:	
<i>Mus norvegicus</i> -----	55
<i>Mus alexandrinus</i> -----	228
<i>Mus rattus</i> -----	61
<i>Mus musculus</i> -----	75
Wood rats-----	1

Number of plague-infected rodents recovered by fumigation, 17.

TRAPPING.

Destruction of rats and the finding of infected areas depend principally on trapping and complete laboratory examination of all rodents. It is of utmost importance in an antiplague campaign to maintain at all times an efficient trapping force.

The city was divided into districts and each district into subdistricts. A squad of trappers with a foreman in charge was placed in each of the subdistricts. Two chief trappers with three assistants were placed in charge of all trappers and foremen. During the fiscal year there has been used, approximately:

Snap traps-----	25, 000
Cages-----	186
Steel traps-----	1, 008

WRECKING.

In the beginning of the campaign, when rodent infection was so general and human cases were being reported almost daily, it was found necessary to institute a very intensive wrecking program. A wrecking force of 40 men divided into three crews, each crew with a foreman, was organized. All rat harborages in the city were removed, block by block, in a systematic way. Wooden floors were removed from sheds, barns, and garages, and a general clean up ordered of each premise. This phase of the campaign was interesting in so far as the infection disappeared in direct proportion to the amount of wrecking completed. The following is a summary of the wrecking operations:

Buildings demolished-----	308
Square feet planking removed-----	950, 684

RAT-PROOFING.

A summary of the rat-proofing operations in the city of Beaumont in accordance with the ordinance passed July 13, 1920, entitled "Public Health Ordinance"—

An ordinance to better protect the public health and particularly to prevent the introduction and spread of bubonic plague by providing for the rat-proofing of all buildings and outhouses and other superstructures, stables and lots, open areas and other premises, sidewalks, streets, and alleys in the city of Beaumont, providing for penalties for the violation thereof, providing

that the invalidity of a part shall not invalidate all of said ordinance, and declaring an emergency—

is as follows:

Number of notices served.....	14,298
New buildings inspected.....	313
Number of premises inspected.....	9,606
Total number of premises in the city.....	9,919
Number of reinspections made.....	42,583
Number of premises abated.....	4,894
By elevation.....	3,185
By marginal wall.....	159
By marginal wall and concrete floor.....	588
By minor repairs.....	5,862
Total buildings rat-proofed by demolition.....	719
Total buildings rat-proofed to date.....	10,513
<hr/>	
Main buildings, class "A":	
Completely rat-proofed.....	268
Work started.....	205
Noncompliant.....	355
Total.....	828
<hr/>	
Square yards concrete.....	45,216
Linear feet chain wall.....	41,731
Cost.....	\$538,155
<hr/>	
Main buildings, class "B":	
Completely rat-proofed.....	4,626
Work started.....	2,603
Noncompliant.....	4,958
Total.....	9,091
<hr/>	
By elevation.....	1,100
Linear feet chain wall.....	2,742
Cost.....	\$901,994
<hr/>	
Sheds and outhouses, class "A":	
Completely rat-proofed.....	406
Work started.....	273
Noncompliant.....	1,072
Total.....	1,751
<hr/>	
Square yards concrete.....	15,445
Linear feet chain wall.....	24,555
Cost.....	\$75,294
<hr/>	
Sheds and outhouses, class "B":	
Completely rat-proofed.....	4,494
Work started.....	3,051
Noncompliant.....	2,569
Total.....	10,114
<hr/>	
By elevation.....	2,085
Cost.....	\$82,552
Total cost of rat-proofing, \$1,597,965.	

PLAGUE SUPPRESSIVE MEASURES AT PORT ARTHUR, TEX.

During the fiscal year ending June 30, 1921, all plague suppressive and eradivative measures in Port Arthur, Tex., were conducted under

the supervision of the United States Public Health Service, with Passed Asst. Surg. H. F. White in charge, in cooperation with the city and State health officers.

The first case of human plague was that of C. M., age 23. He worked on the docks in Galveston, where he was taken sick, and remained in Galveston five days, and went to Port Arthur, where he died on the day of his arrival. This case was seen only after death.

The first plague-infected rodent was captured on October 25, 1920, at 517 Houston Street.

The infected foci were fumigated and all rat harborages were removed. Intensive trapping was instituted.

Wrecking and fumigating were started in the latter part of October, 1920. This force was continued about three weeks.

Summary:

Number of sheds wrecked to destroy rat harborages	829
Square yards of planking removed	15, 919
Number of buildings fumigated with cyanide gas	3
Number of pounds of cyanide used	62
Pints of sulphuric acid used	93½
Cubic feet of space fumigated	156, 400

Number of rodents found after fumigation of buildings and ships, by species:

<i>Mus norvegicus</i>	114
<i>Mus rattus</i>	136
<i>Mus alexandrinus</i>	167
Total	417

TRAPPING.

Intensive trapping operations were carried on from July 18, 1920, to June 15, 1921. Rodents received by the service laboratory were as follows:

Rodents found dead, 225, by species:

<i>Mus norvegicus</i>	175
<i>Mus rattus</i>	8
<i>Mus alexandrinus</i>	37
Wood rats	5

Number of rodents trapped on wharves, 7,345.

Number of rodents trapped on premises, 45,300, by species:

<i>Mus norvegicus</i>	12, 228
<i>Mus rattus</i>	537
<i>Mus alexandrinus</i>	2, 656
<i>Mus musculus</i>	12, 318
Wood rats	23, 641
Putrid	1, 436
Miscellaneous	18
Total number of rodents received by laboratory	53, 287
Total number of rodents examined by laboratory	53, 287
Number of positive rodents	1

PLAGUE SUPPRESSIVE MEASURES IN JEFFERSON COUNTY, TEX.

The trapping operations were started in Jefferson County, Tex., during November, 1920, and discontinued June 30, 1921. The operations were under the supervision of the United States Public Health Service, with Passed Asst. Surg. H. F. White in charge, working

in cooperation with the county and State health officials. One infected rodent was found. No human cases occurred. The infected rodent was trapped in weeds at McFaddin's pumping station, 6 miles out of Beaumont, on the Port Arthur Road, October 11, 1920. All buildings in this vicinity were fumigated and all rat harborages removed. Intensive trapping operations were instituted.

A summary of work performed:

Number of buildings fumigated.....	6
Pounds of cyanide used.....	190
Pints of sulphuric acid used.....	285
Cubic feet of space fumigated.....	608, 200
Number of sheds and buildings wrecked to remove rat harborages.....	5
Square yards of planking removed.....	550

A summary of trapping operations:

<i>Mus norvegicus</i>	19, 651
<i>Mus alexandrinus</i>	3, 247
<i>Mus rattus</i>	303
<i>Mus musculus</i>	5, 574
Wood rats.....	12, 020
Putrid.....	1, 208
Miscellaneous.....	62
Total rodents received and examined by laboratory.....	42, 065
Number of positive rodents.....	1

PLAGUE SUPPRESSIVE MEASURES IN CALIFORNIA.

The activities of the service in California under the direction of Passed Asst. Surg. W. T. Harrison during the past fiscal year may be divided into: (1) Operations in the city of San Francisco; (2) operations in the field for the eradication of ground squirrels; and (3) operations of the Federal laboratory.

Numerous representations have been made to the east bay cities of the urgent necessity for the adoption and enforcement of rat-proofing ordinances and continuous examination of rats as a check on the development of plague infection, but without results to date. The presence of plague-infected squirrels in the range of hills immediately east of this thickly populated region, in some instances within the corporate limits, presents an ever-present menace which may at any time result in an epizootic among the rats. This condition has been thoroughly explained to the proper authorities upon numerous occasions.

OPERATIONS IN THE CITY OF SAN FRANCISCO, CALIF.

With the beginning of the fiscal year a force of four trappers were employed by the city to serve under the direction of a service foreman. A fund of \$5,000 was allowed by the board of supervisors for this purpose after numerous representations from service officers. Trapping operations were continued until the end of the first week in May, 1921, whereupon, with the exhaustion of this fund, operations were discontinued. The city authorities appreciate the necessity for continuing this work, and it is probable that additional funds will be allowed for the ensuing fiscal year.

The following table gives the result of trapping operations:

Species.	Number trapped.	Number found dead.	Number per trapper per day.
<i>Mus norvegicus</i>	7,269	85	.....
<i>Mus alexandrinus</i>	1,215	38	.....
<i>Mus rattus</i>	832	19	.....
<i>Mus musculus</i>	936	.....	.....
Total.....	10,252	142	13.4

No plague infection was found in the city.

MEASURES TAKEN FOR THE ELIMINATION OF RAT FOOD.

Complaints referred from city health department and from other sources investigated from July 1, 1920, to June 30, 1921, were as follows:

Rat complaints.....	557
Manure and stable complaints.....	65
Chicken, rabbit, pigeon, etc., complaints.....	412
Garbage and defective garbage cans.....	131
Rubbish complaints.....	33
Plumbing complaints.....	6
Insanitary premises, including shacks.....	270
Stench complaints.....	111
Goat, dog, and cat complaints.....	41
Mosquito, fly, and flea complaints.....	46
Swine complaints.....	10
Miscellaneous.....	73
Total.....	1,755

NOTE.—All the above complaints were investigated by the inspectors, the necessary notices prepared and sent out, and reinspections made to determine as to whether the existing nuisances were abated.

Measures taken for the destruction of rat food.

Number of premises inspected.....	19,681
Number of nuisances abated.....	2,580
Number of complaints investigated.....	1,755
Number of garbage cans installed.....	1,274
Number of chicken yards abandoned.....	105
Number of chicken houses concreted (square feet, 980).....	7
Number of chickens, pigeons, rabbits, etc., disposed of.....	1,325
Number of plumbing complaints referred to board of health.....	86
Number of vacant lots cleaned.....	21
Number of basements cleaned.....	250
Number of yards cleaned.....	50
Number of premises cleaned of rubbish.....	2
Number of lots from which stagnant water has been pumped.....	1

Measures taken for the destruction of rat harbors.

Number of floors torn up.....	263
Number of basements torn up.....	46
Number of yards torn up.....	72
Number of buildings destroyed.....	145
Number of stables destroyed.....	21

Measures taken for the permanent rat-proofing of food places.

Number of buildings rat-proofed by concreting-----	318
Basements concreted (square feet, 49,885)-----	46
Floors concreted (square feet, 408,513)-----	262
Yards, passageways, sidewalks, etc., concreted (square feet, 4,299)-----	9
Total area concrete laid (square feet, 462,699).	
Number of area walls installed (cubic feet, 27,387)-----	86
Number of buildings rat-proofed by area walls and wire cloth (square feet, 35,086)-----	38
Ventilators on roofs screened-----	200
Sidewalk gratings screened-----	263
Lens lights replaced-----	702
Doors rat-proofed-----	17
Openings in walls, ceilings, and floors, and around pipes closed by wire cloth and cement-----	6, 170
Finished ceilings removed from basements (square feet, 8,750)-----	9

Existing building (not rat-proof) repaired, using rat-proof materials.

Number of buildings rat-proofed by concreting-----	42
Basements concreted (square feet, 60,050)-----	25
Floors concreted (square feet, 9,640)-----	17
Yards concreted (square feet, 1,100)-----	2
Sidewalks concreted (square feet, 2,950)-----	10
Total square feet laid in old premises, 73,740.	
Number of area walls installed (cubic feet, 6,530)-----	26

Condemnation proceedings.

Number of buildings submitted to board of health for condemnation-----	146
Number of buildings acted on by board of health and condemned-----	83
Number of buildings acted on by board of health and not condemned-----	79
Number of buildings abated following condemnation proceedings-----	² 129
Number of buildings condemned and remaining unabated-----	110

OPERATIONS IN THE FIELD FOR THE ERADICATION OF GROUND SQUIRRELS.

The service has continued to operate in the 10 infected counties, but after August 1, 1920, with a considerably reduced force. In view of the necessity for curtailing expenditures, inspectors have been located in the centers of population, and an effort has been made to maintain comparatively squirrel-free zones adjacent to these cities. Cooperative relations have been maintained with the State board of health, the State department of agriculture, the county horticulture commissioners, the various farm bureaus and independent organizations, and the Federal Biological Survey. The efforts of all of these agencies have continued in the education of the public in the value of eradication measures.

No hunting operations were carried on, with the exception of a short period in San Benito County, in order to locate an infected focus from which a human case originated in February.

The following table gives the result of field operations:

Squirrels collected and examined-----	614
Number found infected-----	8
Other animals collected and examined-----	9
Found infected-----	0

² These include some buildings condemned during previous years, hence totals will not balance.

Federal and county inspection service.

Number of inspections.....	2, 092
Number of reinspections.....	5, 512
Number of acres inspected.....	984, 315
Number of acres reinspected.....	2, 044, 089
Acres treated:	
Waste balls.....	163, 663
Poisoned grain.....	911, 355
Destructors.....	537
Number of holes treated.....	1, 029, 780
Number pounds poisoned grain mixed for private owners under supervision of service.....	69, 136
Material used in above operations:	
Poisoned grain (pounds).....	270, 887
Carbon bisulphide (gallons).....	14, 949
Waste balls.....	1, 029, 780

HUMAN PLAGUE.

Two cases of human plague were notified during the fiscal year, both from San Benito County and in adjacent valleys, separated by a ridge of the Coast Range. Both cases were undoubtedly of squirrel origin.

OPERATIONS OF THE FEDERAL LABORATORY.

A résumé of the work of the laboratory follows:

Blood for Wasserman reaction:

United States Marine Hospital—	
San Francisco.....	3, 165
Los Angeles.....	262
United States Public Health Service Hospital—	
Immigrant Hospital, Angel Island, Calif.....	5
Arrowhead Springs.....	75
War Risk Insurance:	
San Francisco.....	153
San Jose.....	10
San Luis Obispo.....	4
U. S. S. cutter <i>Bear</i>	1

Cerebrospinal fluid for Wasserman reaction.

United States Marine Hospital:

San Francisco.....	45
Los Angeles.....	1
Blood culture for <i>B. typhosis</i> (United States Marine Hospital, San Francisco).....	20
Urine for <i>B. typhosis</i> (United States Marine Hospital, San Francisco).....	17
Sputum for <i>B. typhosis</i> (United States Marine Hospital, San Francisco).....	1
Blood for Widal reaction (United States Marine Hospital, San Francisco).....	26
Feces for typhoid bacilli:	
United States Marine Hospital, San Francisco.....	26
Public Health Service, San Luis Obispo.....	1
Bloody pus from abscess for typhoid (United States Marine Hospital, San Francisco).....	2
Guinea pig inoculation for tuberculosis (United States Marine Hospital, San Francisco).....	32
Appendix.....	1
Bloody feces.....	1
Bloody pus.....	8
Epididymis.....	1
Hydrocele.....	1
Knee joint.....	1
Pleural fluid.....	6
Spinal fluid.....	4
Urine.....	9

United States War Risk Insurance (San Luis Obispo)-----	9
Sputum-----	9
Sputum examination for tuberculosis-----	2
War Risk (San Luis Obispo)-----	2
Autogenous vaccine-----	39
United States Marine Hospital, San Francisco-----	37
United States War Risk Insurance, San Francisco-----	2
Tissue for histological examination-----	282
United States Marine Hospital, San Francisco-----	281
United States Public Health Service Laboratory-----	1
Examination for bacteriological growth-----	29
Blood-----	13
Pleural fluid-----	4
Pus-----	1
Spinal-----	5
Urine-----	4
Varicose vein-----	1
War Risk, San Francisco (urine)-----	1
Neo-salvarsinized serum (United States Marine Hospital, San Francisco)---	2
Feces for amoeba (United States Marine Hospital, San Francisco)-----	1
Cerebrospinal fluid for cell mount (United States Marine Hospital, San Francisco)-----	11
Cerebrospinal fluid for Nonne test (United States Marine Hospital, San Francisco)-----	10
Cerebrospinal fluid for Noguchi butyric acid test (United States Marine Hospital, San Francisco)-----	16
Bloody mercurialized serum (United States Marine Hospital, San Francisco)-----	2
Organism identification:	
United States Marine Hospital, San Francisco-----	12
United States War Risk Insurance, San Luis Obispo-----	2
Urine examination microscopic (United States War Risk Insurance, S. L. O.)-----	1
Cultures for meningitis (United States Immigration Hospital, A. I.)-----	3
Cultures for diphtheria (United States Immigration Hospital, A. I.)-----	1
Cultures for <i>B. pestis</i> , human (Hollister, Calif.)-----	3
Human suspect, United States Marine Hospital, San Francisco-----	1
Feces examination for hookworm ova (United States Marine Hospital, San Francisco)-----	1
Kaiserling specimen (Dr. Gay, Berkeley, Calif.)-----	1
Blood count (United States Marine Hospital, San Francisco):	
White-----	1
Red-----	1
Differential-----	1
Cultures for spores (United States Marine Hospital, San Francisco)-----	6
Sterility test (United States Marine Hospital, San Francisco):	
Catgut-----	2
Kangaroo tendon-----	2
Water-----	3
Serum inactivation (United States Marine Hospital, San Francisco)-----	2

Rodent examination.

	Re- ceived.	Exam- ined.	Found infected.
Squirrels-----	614	614	8
Rats-----	11,709	11,654	.....
Mice-----	876	876	.....
Gophers-----	1	1	.....
Rabbits-----	7	7	.....
Field mice-----	1	1	.....
Total-----	13,208	13,153	8

Bacteriological examination of water.

Social-service commission, Redwood City-----	1
Northwestern Pacific Railroad Co-----	1
S. S. <i>West Camak</i> -----	1
S. S. <i>Lake Gunni</i> -----	1

Bacteriological examination of ice.

S. S. <i>Lake Gunni</i> -----	2
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PLAGUE SUPPRESSIVE MEASURES AT SEATTLE, WASH.

During the fiscal year ending June 30, 1921, the plague suppressive measures on Puget Sound were continued under the direction of Surg. Hugh de Valin.

Rat-proofing of buildings.

New buildings inspected-----	584
New buildings reinspected-----	841
Floors concreted, new buildings (283,236 square feet)-----	130
Basements concreted, new buildings (286,215 square feet)-----	155
Yards, etc., concreted, new buildings (57,681 square feet)-----	42
Sidewalks concreted (226,910 square feet).	
Total concrete laid, new buildings (854,042 square feet).	
New buildings elevated-----	58
New premises rat-proofed, concrete-----	327
Old buildings inspected-----	97
Premises rat-proofed, old buildings-----	97
Floors concreted, old buildings (179,910 square feet)-----	97
Premises otherwise rat-proofed, old buildings-----	0
Rat holes cemented-----	106
Wooden floors removed (old buildings)-----	97
Buildings razed-----	47

Water front.

Vessels inspected-----	567
Vessels fumigated-----	124
Sulphur used (182,550 pounds).	
New rat guards installed-----	306
Defective rat guards repaired-----	567
Fumigation certificates issued-----	124
Canal Zone certificates issued-----	68
Port sanitary statements issued-----	1, 619

Laboratory operations.

Dead rats received-----	304
Rats trapped and killed-----	15, 130
Rats after fumigation-----	1, 970
Total rats-----	17, 404
Rodents examined for plague infection-----	14, 524
Rodents proven plague infected-----	0
Blocks poisoned-----	124
Poison distributed, pounds-----	642

Classification of rodents.

<i>Mus rattus</i> -----	2, 523
<i>Mus alexandrinus</i> -----	3, 028
<i>Mus norvegicus</i> -----	9, 753
<i>Mus musculus</i> -----	2, 100

Miscellaneous work.

Letters sent contractors, rat-proofed, new buildings-----	530
Letters sent re rat complaints-----	37

Interstate sanitary laboratory.

Blood:	
Syphilis, Wasserman's	823
Erythrocyte counts	43
Leucocyte counts	43
Differential counts	43
Malaria	7
Haemoglobin	36
Urine:	
Routine	3,962
Special	680
Quantitative sugar	10
Feces:	
Dysentery—	
Entamebic	15
Bacillary	2
Occult blood	1
Sputum:	
Tubercle bacillus	613
Stomach contents:	
Routine	118
Spinal fluid:	
Wasserman	17
Globulin test	14
Cell count	14
Bacteriological examinations:	
Pus	2
Exudates	20
Transudates	0
Discharges—urethral	224
Throat smears—Vincent	10
Throat smears—diphtheria	1
Tissue examinations:	
Bone for tuberculosis	1
Miscellaneous examinations:	
Smears, rat heart and liver, for tuberculosis	2
Smears, rat heart and liver, for leprosy	2
Smear, throat, for G. C.	1
Vaccines, autogenous	1

RAT SURVEYS IN NEW ENGLAND SEACOAST CITIES.

In August, 1920, the matter of preparation of New England ports against possible infection of plague was undertaken by Passed Asst. Surg. L. L. Williams, jr. A rat survey was made of 16 municipalities in Massachusetts with a water front that is used in part for purposes of shipping. A report with recommendations was submitted to the Massachusetts Legislature. A special appropriation was obtained from the legislature, with which a rat survey was made in Boston and a rat-catching campaign started with a representative of the State health department in charge. The captured rats were examined by the Boston city health department. During this survey, which lasted about five months, a total of 6,228 rodents was caught, *Mus norvegicus* 5,225, *Mus rattus* 501, *Mus alexandrinus* 223, and *Mus musculus* 279. No plague infection was found. The work was continued by the Boston city health department after the survey.

In Connecticut a rat survey of all seaports was made by the service officer with a view to determining present conditions and probability of rat infestation, together with the possibility of arrival of plague infection. A report on the findings of this survey was submitted to the State health officer of Connecticut for use before the legislature.

A similar survey was made in Rhode Island and Maine. In the latter, due to the efforts of the service officer and local officials, the city board of health of Portland authorized an appropriation to initiate a rat survey.

During June a meeting was held by the Boston Chamber of Commerce, attended by many representatives of business and civic organizations all over New England. This meeting was addressed by officials from the Public Health Service, including the Surgeon General, by the city health officer of Boston and the State health officer of Massachusetts. At this meeting it was suggested that a committee be formed, representative of New England as a whole, to further the progress of antiplague measures. The scope and possibilities of such a committee seem so great that considerable time and work is being put into its formation. The individual members will be of great assistance in organizing the business and civic organizations in their respective States and communities and can greatly facilitate the service officer's endeavors. Such a committee can secure more effective and widespread publicity than could any other organization. Work on this committee is now well under way.

RAT-PROOFING STATUS OF THE NEW YORK CITY WATER FRONT.

During April and May, 1921, an investigation into the rat-proofing status of the New York City water front was made by Junior Assistant Sanitary Engineer E. C. Sullivan. The investigation included an inspection of the docks, piers, and water front of the various sections of the New York metropolitan area. A preliminary report has been prepared giving existing conditions of this immense water front regarding rat-proofing and the more important factors requiring consideration to obtain more satisfactory rat-proof wharves and water-front structures.

RODENT INFESTATION AND RAT-PROOFING CONDITIONS IN BALTIMORE, MD.

During May and June, 1921, a survey was made of Baltimore, Md., by Associate Sanitary Engineer A. F. Allen, to assist the health officials in determining the extent of the rodent infestation of the city and to make recommendations as to the means of overcoming or controlling this infestation, particularly with a view to ascertaining whether or not rodent plague had secured a foothold in Baltimore, and, further, to make a study of conditions and the proper methods for correcting them to insure as far as possible the relative rat-proofing of the buildings in the city to the extent that should rodent or human plague at any time make its appearance in the city, means might be readily available to combat the plague. A detailed report with definite recommendations has been prepared and submitted concerning the survey findings in Baltimore.

RAT SURVEY IN CHARLESTON, S. C.

The rat survey of Charleston, S. C., was carried out during the period July 27 to October 20, 1920, under the supervision of Passed Asst. Surg. C. V. Akin. A preliminary survey was made July 7 to 12, 1920, as a result of which the city council voted a sum of \$5,000 in conducting the rat survey in addition to service funds.

The laboratory force consisted of four assistants under the supervision of the city bacteriologist. The trapping force varied from 4 to 10, the average daily trapping force for the period being 8.45 men.

In all, 9,586 rats and 3,368 mice were trapped, giving a total of 12,954 rodents destroyed. The average daily catch was 131.31 rats and 46.02 mice, and the average daily catch per man was 15.53 rats and 5.43 mice. No signs of plague infection could be demonstrated in the rodent catch when examined at the laboratory.

RAT SURVEY AT SAVANNAH, GA.

The rat survey of Savannah, Ga., was begun on August 23, 1920, under the supervision of Passed Asst. Surg. W. S. Bean. The total rodent catch in Savannah during the period August 23 to October 30, 1920, was 10,351: *Mus norvegicus*, 6,040; *Mus alexandrinus*, 614; *Mus rattus*, 272; and *Mus musculus*, 3,425. The rat catch per trap-per day was three. No plague infection was noted upon examination.

RAT SURVEYS IN FLORIDA CITIES.

After a conference with the State health officer of Florida, Asst. Surg. M. F. Haralson, during the period July 11 to August 17, 1920, visited Jacksonville, Fernandina, St. Augustine, Daytona, West Palm Beach, Miami, Key West, Tampa, Cedar Keys, Carrabelle, Apalachicola, Panama City, and Milton, Fla., concerning the institution of rat-trapping measures in these towns. Emphasis was placed upon the making of rodent surveys with subsequent examinations of all rats at one of the State board of health laboratories. Efforts were made to secure the passage of a rat-proofing ordinance, and also a suitable garbage collection and disposal ordinance at those places lacking such means. Expert supervision and detailed instruction in actual trapping methods were given to designated city employees in the different cities. As a result of these conferences with the local officials in each town, rat-trapping measures were instituted and action taken concerning the adoption of adequate ordinances.

The rat survey of Key West, Fla., was made during the period of June 26 to August 28, 1920, under Senior Surg. G. M. Guiteras.

Total rodent catch.

Period.	Official trappers.					City and navy yard.				
	Nor-vegicus.	Rattus.	Alex-andrinus.	Mice.	Total.	Nor-vegicus.	Rattus.	Alex-andrinus.	Mice.	Total.
June 26 to July 1.....						2		6	5	13
July 1 to 31.....	510	6	560	770	1,846	60		57	217	334
Aug. 1 to 28.....	340	12	266	516	1,134	29	1	81	275	386
Total, June 26 to Aug. 28.....	850	18	826	1,286	2,980	91	1	144	497	733

Total rats.....	1,930
Total mice.....	1,783
Total rodents.....	3,713

The trapping force consisted of one foreman and four trappers. During the active trapping period, July 8 to August 28, an average of 69.2 rats were captured daily. Almost all of the 1,930 rats caught were autopsied and carefully examined in the laboratory. All results were negative, showing that the city, as far as could be determined, was free from plague.

RAT SURVEY OF TEXAS CITIES.

On July 22, 1920, a rat survey was begun at Orange, Tex., under the supervision of Passed Asst. Surg. R. M. Grimm. The laboratory car "Hamilton" was used in this rat survey. The survey lasted until August 6, 1921. During this period a total of 1,019 rodents were caught and examined—868 rats and 151 mice. No plague infection was found. As a result of the rat survey the city authorities continued to maintain a trapping force of five men, forwarding the rodent catch to the laboratory at Beaumont for examination. In this connection a movement was also began to establish an efficient garbage collection and disposal system.

On August 7, 1920, the laboratory car "Hamilton" was transferred to Houston, Tex., and a rat survey was made there in the period ending August 21, 1920. The total rodent catch was 2,876. No plague infection was found upon examination of the rodents. As a result of this rat survey a laboratory for rodent examination and a rat-trapping force were established and continued by the local and State health authorities.

On August 21, 1920, the laboratory car "Hamilton" was transferred to Freeport, Tex., where a rat survey was made in the period ending August 27, 1920. The rodent catch of 67 upon examination showed no signs of plague infection. In view of this and also that practically all the buildings were on pegs to keep them off the wet, marshy ground, further trapping was found unnecessary.

On August 27 the laboratory car "Hamilton" was moved to Corpus Christi, Tex., where a rat survey was made during the period ending September 5, 1920. A total of 848 rodents were trapped and examined, but no plague infection was noted. In addition, a total of 35 rodents trapped at Aransas Pass, Tex., was examined with negative plague results.

PREVENTION OF THE SPREAD OF COMMUNICABLE DISEASES.

Recognizing that the most effective and most economical means of preventing the spread of disease from one State to another at the disposal of the Federal Government lies in the development and utilization of strong State health departments, and that divisions of communicable diseases are vital components of State health departments, assistance has been rendered the State health officers as far as possible to develop these divisions and bring them to a high plane of effectiveness. As a result of these efforts in the past two years, divisions of communicable diseases have been established in two State health departments and existing communicable disease divisions in five other States have been greatly improved.

INDIANA.

The service officer, Asst. Surg. M. V. Ziegler, detailed to the State board of health of Indiana continued his activities as epidemiologic aid during the past fiscal year.

During the year 30,346 morbidity reports have been collected in the State and tabulated according to geographical units, diseases of the week and month, age and sex groups. This information has been transformed into graphs and charts showing the different characteristics of each disease, the prevalence of disease in certain age groups, the seasonal variation, its increase or decrease in prevalence, and the geographical location, according to sanitary sections. The following is the number of morbidity reports received by this office each month during the year: July, 1,072; August, 987; September, 1,081; October, 2,162; November, 2,687; December, 3,323; January, 3,624; February, 3,639; March, 3,847; April, 3,864; May, 2,388; June, 1,662.

Fifty thousand franked report cards were distributed by this office. Letters have been written to health officers failing to report regularly and promptly.

Epidemics investigated during the fiscal year ending June 30, 1921, are as follows:

Disease.	Number of cases.	Location.	Vehicle of transmission.
Typhoid.....	7	Veedersburg.....	Milk.
Do.....	28	Andrews.....	Water.
Do.....	5	Windfall.....	Do.
Do.....	10	Washington.....	City water.
Do.....	16	Anderson.....	Chlorine cut off water.
Do.....	25	La Porte.....	Contaminated milk.
Do.....	4	St. Mary Woods.....	Rural well contaminated.
Do.....	4	Mooresville.....	City water.
Do.....	4	New Castle.....	Incorrect diagnosis.
Gastro-enteritis.....	349	Plainfield.....	Unknown.
Measles.....	35	Nora.....	Contact.
Smallpox.....	3	Star City.....	Contact (diagnosis).
Do.....	1	New Richmond.....	Do.
Do.....	36	French Lick.....	Contact.
Do.....	1,000	East Chicago.....	Do.
Do.....	10	West Baden.....	Do.
Scarlet fever.....	4	Churubusco.....	Contact (diagnosis).
Do.....	3	New Richmond.....	Contact.
Do.....	4	Morristown.....	Do.
Do.....	17	Greencastle.....	Do.
Diphtheria.....	2	Morristown.....	Do.
Do.....	35	Summitville.....	Do.
Do.....	40	Boswell.....	Do.

Upon completion of each of the respective epidemiological investigations, public health measures were instituted for the purpose of suppressing the epidemic.

During the year lectures on "Control of Communicable Diseases in State Institutions," "Institution Hygiene," "Rats and Rat Extinction," "Plague," "Epidemiology," "Water," "Milk," "Sewage Disposal," "Insect Transmission," "Vital Statistics," "School Hygiene," "Public Health Nursing," "Trachoma," and "Typhoid Fever" were presented before 23 assemblages.

During the latter part of this year a campaign was inaugurated for better reporting of tuberculosis. Upon checking the morbidity

reports on tuberculosis against the death certificates it was found that there were more deaths from tuberculosis than cases reported. Each month the death certificates are checked against the morbidity reports. Upon failure to find the morbidity report of a death, a form letter is sent to the health officer in whose jurisdiction the death occurred requesting that his files be searched to ascertain whether the case was reported to him. Upon a negative reply from the health officer the physician signing the death certificate is then notified and requested to send in the morbidity report at once. To date the system has been a success as already there is a noticeable difference in the morbidity reports on tuberculosis. During the year 492 letters have been sent out regarding tuberculosis; 152 health officers were notified, of whom 124 answered satisfactorily; 120 physicians were notified, of whom 99 answered satisfactorily.

Thirty-eight State institutions were visited during the year upon the request of the Secretary of the State board of health to ascertain the sanitary and hygienic conditions, as well as to institute medical examination of the inmates for infectious eye conditions. As a result of these surveys, it was found that among 1,728 persons examined 225 were suffering with trachoma (13 per cent trachoma).

MARYLAND.

The service officer, Asst. Surg. R. B. Norment, jr., detailed to the State department of health of Maryland, continued his activities as epidemiologic aide during the past fiscal year.

The endemic index completed in November, 1919, has been used by the State department of health during the year as a standard of endemicity. It has been found that more accurate indices of endemic typhoid fever in Maryland can be obtained for a given year by the proportionate distribution of the morbidity figures for the preceding year, than by proportionate distribution of the State typhoid medians for the preceding 11 years. The actuarial method of calculating typhoid expectancy, which has been used for a number of years in the State department of health, therefore, furnishes more accurate typhoid indices for Maryland than does the endemic index. For the other communicable diseases the endemic index seems to furnish more accurate indicators of endemicity.

During the year a study was conducted in two counties in Maryland, for the purpose of locating and analyzing endemic foci of typhoid fever. This study, which began in April, 1920, resulted in the formulation of a rather simple method for conducting such investigations.³ Ten chronic typhoid carriers were apprehended. Five of these "carry" bacillus typhosus, and five paratyphosus Beta.⁴

Four typhoid outbreaks were investigated during the year. The epidemiologic data in three of these outbreaks indicated rather definitely that polluted drinking water was the source of infection. The data in the remaining outbreak indicated infected milk as the source of infection. A chronic typhoid carrier was apprehended on the farm from which the milk in question was obtained.⁵

³ Paper entitled "Endemic Focal History in the Routine Investigation of Rural Typhoid" was submitted to the bureau for publication on Jan. 25, 1921.

⁴ Cultures confirmed at the Hygienic Laboratory, Washington.

⁵ This carrier (*B. typhosus*) not included in the group of 10 mentioned above.

Five smallpox investigations were conducted in Maryland during the year. Six cases were seen in which the diagnosis of suspected smallpox was erroneous. Three of these were found to be scabies, one chickenpox, one papular syphilis, and one dermatitis venenata. An outbreak of 34 cases occurred at Brunswick, Md. The primary cases in this outbreak probably contracted their infection while working in West Virginia.

In March, 1921, following a complaint to the bureau concerning interstate spread of smallpox from West Virginia to Maryland, an investigation was conducted in the eastern part of West Virginia. It was found that the West Virginia authorities had failed to institute effective measures to prevent the general spread of smallpox, and that, in all probability, interstate infection had repeatedly occurred on this account.

An outbreak of 17 cases of poliomyelitis in the western part of Washington County was studied. Five additional cases were found which were believed to be nonpapalytic poliomyelitis.

Demonstrations were conducted in three boarding schools relative to methods of control of the spread of scarlet fever without interrupting routine school activities. The personnel of one of these schools, faculty, students, and employees, numbered 460 persons, in another 60 persons, and in the third 50 persons. It was not found necessary to close any of these schools for a single day on account of the occurrence of scarlet fever.

Preliminary data has been assembled for the purpose of delimitation and study of endemic foci of diphtheria in Washington County. This study will be conducted in connection with the recently organized Washington County health demonstration.

Two small outbreaks of diphtheria were investigated. In both instances the cause of the spread was direct contact with known cases of diphtheria in which quarantine regulations had been violated.

Assistance was rendered the visiting physician to the Washington County Orphans' Home in the administration of Shick tests on 30 inmates. Eleven of these children showed a positive reaction and were subsequently immunized with toxin antitoxin mixture.

Following a report to the bureau of a case of suspected leprosy at Cumberland, Md., an investigation was made in order to confirm or disprove this diagnosis. It was concluded that this patient was suffering from one of the varieties of trophoneurosis, usually classified as Raynaud's disease, and that the condition was secondary to a frost-bite gangrene which occurred during the month of November, 1908.

Three cases of suspected encephalitis lethargica were investigated. Only one of these furnished data which seemed to justify the diagnosis. The remaining cases were probably influenza with meningeal symptoms. The latter cases promptly recovered after a short illness.

One case of pemphigus and one case of rabies (dog) were investigated.

The epidemiologic aide accompanied the service officer detailed to investigate a case of suspected pestis minor at Baltimore. The history and findings in this case did not warrant a diagnosis of pestis minor.

Communicable disease regulations modeled after "The Control of Communicable Diseases," a report of the American Public Health

Association Committee on Standard Regulations, were passed by the Maryland State board of health on October 14, 1920. The service officer recommended the passage of such regulations on January 24, 1920.

The service officer acted as State venereal disease officer for Maryland from January 1, 1921, to June 30, 1921.

Five public addresses were given during the year—two at Frederick, Md.; one at Hagerstown, Md.; one at Brunswick, Md.; and one at Lakewood, N. J.

MASSACHUSETTS.

The service officer, Passed Asst. Surg. Louis L. Williams, jr., detailed to the State department of health of Massachusetts, continued his activities as epidemiologic aide during the past fiscal year.

During July and the major portion of August, the work in the Connecticut Valley as acting district health officer was completed in cooperation part of the time with the temporary district health officer. This work mainly comprised the investigation of small local outbreaks of smallpox and diphtheria, the introduction of public-health nurses in various places, and in rendering assistance to local health agents in the valley.

During this time, two mosquito surveys were made, one at East Lexington and one at Weston, Mass. So far as determined, East Lexington has done nothing of a corrective nature; Weston, however, has carried on rather extensive anti-mosquito measures with good results.

Assistance was rendered in introductory work looking toward the rural sanitation cooperative demonstration of Cape Cod.

During the past year, addresses on plague and other public health subjects were delivered before seventeen assemblages.

WISCONSIN.

The assignment of Surg. Robert Olesen of the service as an epidemiologic aide to the Wisconsin State board of health was originally made for the purpose of establishing endemic indices for the reportable diseases. However, a preliminary study showed that while helpful indices could be prepared, they were only approximately accurate. It was early recognized that the value and accuracy of the indices could materially be enhanced by improving the morbidity registration. Consequently constant efforts were put forth to secure more complete and reliable reports. An increased number of reports have been received since the work was inaugurated. The method used in obtaining more complete morbidity reports has been made the subject of a special paper which was presented before the conference of State and Territorial health officers in Boston by the State health officer.

VISUALIZATION OF RECORDS.

The visualization of communicable disease records through use of the thermometer-like devices has been continued. Through this a close check has been maintained on communicable disease prevalence.

In connection with the work of establishing endemic indices for the reportable diseases and improving registration efforts were made

to prevent and control these affections. A temporary organization was effected, the service representative serving as the acting director of the bureau of communicable diseases. In this capacity correspondence relating to communicable diseases was handled and the general policy for carrying on the activities was formulated. The work performed while serving in this capacity is considered under three principal headings, namely, administrative, educational, and investigative.

ADMINISTRATIVE ACTIVITIES.

Establishment of bureau of communicable diseases.—When the service representative came to Wisconsin there was no bureau of communicable diseases in the State board of health. The need for such a bureau being clearly recognized a definite campaign for its acquisition was developed. The legislature of 1921 finally appropriated an amount for the establishment of a bureau of communicable diseases. The legislature also appropriated liberal funds for the bureau of child welfare and public health nursing, as well as for the bureau of venereal disease control. The State board of health, in the interest of economy and efficiency, has consolidated the bureaus of communicable and venereal diseases under one head.

Supervision of local health officers.—Unremitting efforts have been put forth to increase the activity of the local authorities. In checking up the qualifications of the 1,741 local health officers in Wisconsin in 1920 it was found that approximately 10 per cent were unaware of their appointment or had not accepted the position. An additional 20 per cent had not qualified for the position by taking the oath of office, thereby placing their official acts in jeopardy. About 40 per cent of the entire number of officials were not supplied with the official rules and regulations and could not reasonably be expected to enforce intelligently the requirements. Approximately the same number were not provided with placards, quarantine signs, or report cards. In 1921 only bona fide officials who had qualified were recognized as health officers. By means of a simple questionnaire their qualifications were learned and their wants both made known and supplied.

Steady pressure upon health officers who are delinquent in making reports has been exerted both by correspondence and personal interviews. Every effort has been made to encourage health officers to study the public health laws and to offer suggestions for their improvement. In this way many excellent ideas have been forthcoming.

Communicable disease reports.—In addition to the weekly and special reports of communicable diseases sent to Washington reports are prepared as an aid in preventing and controlling these affections in Wisconsin. Each week reports are prepared for the five deputy State health officers, the number of cases of each disease and the places in which they occurred being shown. The commissioner of health of Milwaukee is also furnished with a detailed weekly report showing the number and location of communicable disease cases in places near Milwaukee.

The Wisconsin State board of health has felt the need of communicable disease reports from neighboring States prior to its publication in the Weekly Public Health Reports. In an effort to stimulate

reciprocal reporting along these lines the State health officers of Minnesota, Michigan, Iowa, and Illinois were given weekly reports of communicable disease prevalence in Wisconsin counties bordering the States mentioned.

Compilation of communicable disease data.—The health officers of the 18 principal cities in the State submit each week individual case reports of communicable diseases. While the data called for on these cards have been reduced to the minimum, there is considerable valuable information contained therein which might be profitably compiled and studied. In addition to these, individual case reports are received from approximately 175 smaller communities in which the health officers have been appointed assistant collaborating epidemiologists. Thus a large number of cards are received each month.

Sanitation advisory committee.—At the request of the State health officer the service representative served as a member of the sanitation advisory committee of the Wisconsin Industrial Commission. This committee met with the sanitary engineer of the commission for the purpose of drafting new rules governing the ventilation of industrial establishments. After numerous meetings and consultations a code was adopted which will shortly be printed and applied in the State.

Preparation of report for the State board of health.—In preparing the communicable disease section of the biennial report of the State board of health, several departures from the accepted order were made. Among other things comparisons were made between the death rates per 100,000 from each disease in Wisconsin and the registration area. The prevailing tendencies were noted and commented upon. The report in question covered the calendar years 1918 and 1919.

Campaign to preserve school vaccination law.—During the present legislature a bill was introduced to repeal the bill requiring the vaccination of school children when smallpox made its appearance in a community. After a strong campaign by both sides the bill failed of passage in the State senate.

EDUCATIONAL ACTIVITIES.

In Wisconsin, local health officers, physicians, nurses, lay people, and hospital heads, in the order named, are kept informed concerning matters relating to the prevention and control of communicable diseases. At the various county fairs the bureau of communicable diseases relied largely for its appeal to the people upon the index measurers of the several maladies, the records being kept constantly up to date. As an aid to the visualization of communicable disease prevalence, various graphic charts were prepared. Charts showing the annual death rates per 100,000 population from each of the communicable diseases, as compared with rates for the same affections in the United States registration area, were also prepared. Bar-graphs showing the relative standing of Wisconsin counties and the principal cities, as based upon the case-fatality ratios of the principal communicable diseases, proved useful in stimulating localities in better morbidity registration.

In order to determine the effect of the campaign for improved morbidity registration, a series of charts were prepared showing the annual number of reported cases as compared with the annual death rates per 100,000 population. These charts were included in a special report submitted to the bureau.

Numerous individual charts illustrating phases of communicable disease control and specific prevalence were devised for lectures and demonstrations. As an aid to the better understanding by lay and professional audiences of communicable disease problems, these charts have proved invaluable.

Stereopticon slides.—A number of slides were prepared applying specifically to local conditions. The artist of the State board of health gave valuable assistance in supplying the pictorial details of these slides. Pictorial representations of the various steps in controlling communicable diseases were shown in another set of slides. These included prompt and early diagnosis, prompt reporting of cases, placarding, isolation, treatment, terminal cleansing, and final physical and bacteriological examination. These slides were displayed in an attractoscope before conferences.

Original articles.—Several articles were prepared for publication, entitled, "Case-Fatality Ratios of Communicable Diseases in Wisconsin Counties," "How to Measure the Efficiency of Local Health Officers," "Outline for the Investigation of Deaths from Diphtheria," "How Morbidity Registration was Improved in Wisconsin," "Case-Fatality Ratios of Communicable Disease in 18 Principal Wisconsin Cities," "Causes of Malnutrition in Children," and "The Value of the Report Card in Communicable Disease Control." A number of stories were prepared for State-wide publication in the newspapers and magazines.

The demand for speakers on public-health topics is steadily increasing and indicate a desire on the part of right-thinking individuals to learn as much as possible on the subject. The service representative, while engaged primarily in the prevention and control of communicable diseases, had the opportunity of discussing other phases of the general public-health problem, delivering addresses before 29 assemblages.

INVESTIGATIVE ACTIVITIES.

Numerous epidemiological investigations were made in the field during the year. In several instances diagnostic services were desired by local health officials. In others the application of measures designed to prevent and control certain diseases were indicated. The principal surveys of this character, together with the places visited, are as follows:

Diseases investigated.	Places visited.
Smallpox.....	Hortonville, Arena, and Richland Center.
Scarlet fever.....	Jefferson and Waukesha.
Diphtheria.....	West Allis, Racine, Chippewa Falls, Westfield and Washington Townships, and Rochester Township.
Typhoid fever.....	Sun Prairie.
Suspected leprosy.....	Westby.

Investigation of deaths from diphtheria.—For several years it has been apparent that the annual death rates per 100,000 population from diphtheria in Wisconsin have been steadily increasing. This was particularly true in 1920, when the rate was higher than during any of the preceding eight years. It was decided to make a careful investigation of each death from this cause recorded in Wisconsin. As soon as a death certificate from diphtheria is filed with the State board of health, a literal transcript is made and sent to the deputy State health officer in whose district the fatality occurred. These deputies, of whom there are five, proceed as soon as practicable to the locality indicated and institute an investigation. In order that each investigation may proceed along uniform lines and cover the more essential phases of the subject, an outline was prepared and detailed instructions given regarding the procedure to be followed and the action to be taken.

These investigations are still under way and much information of a vital character is being obtained. The outline and instructions mentioned above have been made the subject of a special report to the Bureau.

OHIO.

During the fiscal year ending June 30, 1921, the service officer detailed to act as epidemiologic aide in the State of Ohio was Passed Asst. Surg. C. Armstrong.

Assistance was rendered the State department of health of Ohio in making an investigation of a severe outbreak of enteritis and typhoid fever at Salem, Ohio, and in applying suppressive measures during October, November, and December, 1920.

Surveys were made of health activities in Columbus, Canton, Akron, Youngstown, Dayton, Cincinnati, Toledo, and Cleveland, Ohio, during January and February, 1921, and the data used in connection with a nation-wide study of health activities in the larger cities of the United States.

Investigations were made of a possible outbreak of influenza at Charlestown, a water-borne outbreak of enteritis at Hillsboro, a smallpox outbreak at Newark, a scarlet fever outbreak at Springfield, and a diphtheria outbreak at Berea.

Considerable headway toward the establishment of endemic indices for the reportable diseases was made during the year, especially in the counties and cities having full-time health officers. The method of collecting, filing, and keeping of morbidity records for the State during the eight or nine years preceding the past 18 months of progressive health legislation in Ohio made the compilation of data for the establishment of an endemic index on the basis of a 10-year period not only a laborious task but one of doubtful value, since experience shows that they are hardly comparable with reports under the present system. Morbidity data for a 10-year period were compiled, however, by villages and townships for two counties of the State, Cuyahoga and Summit, and endemic indices based upon them are now in operation in these localities.

Health officers have been encouraged by every opportunity to insist upon prompt and full morbidity reports from physicians and others charged by law with the reporting of the reportable dis-

eases, and to keep their records in such manner as would render the accumulating data of the past 18 months and of the years to follow easily available for the purpose of comparing with current records, or in other words the establishing of endemic indices. Morbidity records for the period of operation of the present system of reporting are being studied in connection with current reports in a large number of counties and cities, and as the accumulation of data proceeds it will soon be possible to have useful endemic indices in operation in these places.

Plans were completed by the epidemiologic aide for the carrying out of an intensive study of the epidemiology of typhoid fever and diphtheria, as well as for the installation of a complete endemic index of the reportable diseases in Portage County, where the county and State are to stage a rural health demonstration.

During half of this fiscal year the service officer assigned as epidemiologic aide in Ohio was detailed outside of the State by the service on special investigations in plague and typhus eradication.

ASSISTANCE TO STATE HEALTH DEPARTMENTS—DIVISIONS OF SANITARY ENGINEERING.

Another vital component of a State health department is a strong division of sanitary engineering. Due to service activities in the past fiscal year sanitary engineering divisions have been established in three States and existing sanitary engineering divisions have been aided in thirteen other States. In addition, assistance was rendered four other States lacking such divisions in carrying out sanitary engineering work. Many State and city health departments were assisted in obtaining chemicals needed in purifying the municipal water supplies.

Assistant Sanitary Engineer A. E. Gorman continued to assist the Kentucky State board of health in the capacity of temporary State sanitary engineer, in accordance with the policy of assisting in the development and organization of sanitary engineering divisions in State health departments. During this period the work consisted largely in making sanitary surveys of public water-supply systems in the State, especially those which were sources of supply for water used for drinking and culinary purposes on common carriers. Where found to be necessary, recommendations were made and followed up for improving the sanitary quality of such supplies or for better operation and control of the water works. Assistance was rendered the State board of health in organizing the sanitary engineering division authorized by the legislature. A water laboratory was designed and installed for this division, and a system for exercising control and supervision over the public water supplies in the State was instituted. After a State sanitary engineer had been obtained with the assistance of the service, further aid was rendered in the State sanitary engineering work.

During the past fiscal year Associate Sanitary Engineer C. N. Harrub continued the cooperative work of the service with the Tennessee State board of health, begun in July, 1919. This work has consisted principally of investigations of water supplies, sewerage systems, epidemics of typhoid fever, and the certification of inter-

state carrier water supplies. During the year investigations were made of 61 individual water supplies, 28 of which had never before been investigated by the State board of health. Sixteen additional communities made or started improvements on their water supplies, making a total of 28 individual supplies which have undertaken improvements during the two years of cooperative endeavor. Investigations were made of 37 individual sources of interstate carrier water supplies, and 137 certificates have been issued to railroad and steamboat companies. Eighteen investigations of sewerage systems were made during the year, 12 of which had not been examined previously. Improvements were made in three sewerage systems, while new sewerage installations were made in the case of three communities and one institution. An investigation of the milk supply of Memphis was made in conjunction with the State and city health officials, and a report on this investigation was forwarded to the bureau.

In January, 1921, a bill to create a bureau of sanitary engineering in the State board of health was prepared and presented to the State legislature. While this bill was not passed because of large amount of legislation, the appropriation for this work was approved and a State sanitary engineer has been obtained.

Assistance was rendered the Mississippi State board of health in obtaining a State sanitary engineer and in instituting the sanitary engineering work in the State.

In July, 1920, assistance was rendered the Wisconsin State board of health by Assistant Sanitary Engineer J. I. Connolly in making surveys of water supplies in the State and in carrying out the cooperative certification policy. Ten water supplies were investigated. Inspections were also made and advice given concerning several creamery wastes disposal plants.

The State department of health of Iowa was assisted in making surveys of several water supplies.

Similar assistance was rendered the State board of health of Nebraska. In addition to the field investigations of water supplies, examinations were made of plans and specifications of water and sewerage systems and water purification and sewage disposal plants. Assistance was also rendered in replying to requests concerning information on sanitary engineering work, complaints of sewage disposal nuisances, etc. Twenty-six water supplies and four sewerage systems were inspected in all.

Assistant Sanitary Engineer J. I. Connolly also assisted the State board of health of Missouri in carrying out the cooperative certification procedure and other sanitary engineering matters and in developing a division of the State board of health to carry on this work. Junior Assistant Sanitary Engineer H. J. Green was also detailed for such work in Missouri. In all 66 water supplies were inspected, the water analyzed, and recommendations made regarding improvements. Inspections were made of sewage disposal plants and sewerage systems in three cities, also the method of disposing of trade wastes of a large oil refinery and an ice-manufacturing plant. Information was collected regarding water supply systems and sources, water purification plants and processes, sewerage systems, and sewage and trade-waste disposal plants in cities in the State.

The State board of health as assisted in a State-wide campaign to educate the people concerning water supplies, sewage disposal, and allied matters, the information being presented through the newspapers, civic and women's organizations, local, county, and State health associations and health officials, municipal and consulting sanitary and civil engineers, engineering and medical societies, and county school superintendents.

Assistance was rendered the State board of health of Arkansas in carrying out the cooperative certification procedure. Inspections were made of 24 water supplies by Junior Asst. Sanitary Engineer L. D. Mars, and of a typhoid epidemic.

Similar assistance was rendered the Oregon State board of health. Inspections were made of 12 water supplies. A typhoid epidemic, due to impure water, was investigated, also the mosquito situation in a community having several malarial cases. Three towns were advised regarding installation of good water-supply systems. Assistance was rendered in the laboratory examination of waters and the office work in connection with State water supplies.

In cooperation with State and local health officials, an inspection was made of the public water supply at Cleburne, Tex., and a report with recommendations was prepared by Associate Sanitary Engineer Sol Pincus.

The State board of health of North Dakota was assisted in carrying out the cooperative certification policy and inspections of State water supplies were made by Asst. Sanitary Engineer I. W. Mendelsohn.

Upon telegraphic request of the State board of health of Idaho, investigations were made by Associate Sanitary Engineer C. N. Harrub, of the municipal water supplies of Boise and Weiser, Idaho, and a report and recommendations prepared concerning improvements found necessary.

To assist certain State health departments lacking adequate funds to carry out sanitary engineering work, the arrangement commenced in the previous fiscal year was continued, whereby one of the State health department personnel was appointed collaborating sanitary engineer of the Public Health Service. By such an arrangement assistance was also rendered in carrying out the cooperative certification policy. States so assisted are Alabama, Florida, Georgia, Idaho, Indiana, Maine, Minnesota, Mississippi, New Hampshire, New Mexico, North Carolina, North Dakota, South Carolina, Vermont, Washington. This arrangement has produced fairly satisfactory results at small cost to the Government.

TRANSPORTATION OF WATER SAMPLES.

Various State health officials reported difficulty in obtaining prompt express transportation of samples of water for analysis, and requested the service to take up with the express company the matter of securing better transportation. The cooperation of the express company was obtained concerning shipments of water samples and a general order was issued by the general traffic manager to all express agents, requiring them to make a special effort to secure earliest delivery of these water samples.

SHORTAGE OF WATER PURIFICATION CHEMICALS IN CITIES.

A situation of alarming seriousness threatened extensive sections of the country in the summer and fall of 1920, when, on account of the extreme transportation difficulties, shipments of liquid chlorine, hypochlorite, sodium chloride, bauxite, alum, soda ash, copperas, and lime, necessary for water purification, were delayed. A severe shortage of one or more of these chemicals was reported to the bureau from cities and States over the entire country, and in many places the conditions were reported so acute that water-borne epidemics were feared or had actually occurred.

The earliest case reported to the bureau was in March, when at Albany, N. Y., an epidemic of gastroenteritis had occurred, due to the lack of alum for the water purification process. A short time later information was received of delay by railroad carriers in providing sufficient cars for shipment of lime to chemical companies and water-treatment plants. This was promptly placed before the Interstate Commerce Commission. The critical delays in shipment of these chemicals, with consequent shortage and disease menace, increased to such an extent and were so widespread that in May, 1920, the health authorities of 16 States requested the bureau to facilitate the shipment of chemicals necessary for the purification of the public water supplies. Two cities in Michigan were at that time reported to have typhoid outbreaks, due to inability to purify the public water supply for lack of chemicals.

Strenuous efforts were at once made to secure relief for the critical situation in which so many cities were placed. The matter was placed in detail before the Interstate Commerce Commission. Other means of relief were sought. The aid of the War Department was obtained, as stores of some of these chemicals were held on hand by that department. The commission on car service of the American Railway Association was requested to allocate cars for certain shipments of chemicals as specified, which were to be speeded with all possible haste. In some cases where the shortage of chemicals was most acute, arrangements were provided for procuring emergency shipments from the nearest available supplies. After continued efforts by the bureau, the Interstate Commerce Commission ordered priority shipment arrangements in carload lots by carriers for all chemicals entering into the purification of water supplies.

Before such priority arrangements were obtained, the health of citizens in many communities had been seriously menaced because of impure water, resulting from the lack of needed chemicals. During July the lack of alum disclosed signs of pollution in the Greensboro, N. C., public water supply, while a similar condition occurred in the water supply of Somerset, Ky., in August. In this month also the supply of alum and chlorine at the waterworks plant in Richmond, Va., became so dangerously low that public warnings were issued to the people to boil the water before use if chemicals were not received within three days. An especially critical shortage of liquid chlorine was experienced by the public waterworks plants at Cumberland, Md., and Minneapolis, Minn., while in Connecticut the State authorities took over the supply and distribution of chlorine for water purification.

One of the most serious sources of this shortage of water purification chemicals was the difficulty of the manufacturers of alum and chlorine to obtain raw materials. This was especially true in the case of alum manufacturers, as their plants were many hundreds of miles from the source of the raw material. The bureau, after a time, was able to provide an arrangement whereby a sufficient number of cars would be placed at the bauxite mines to satisfy the requirements for making alum for water purification needs, and these shipments speeded to the chemical plants.

Fortunately before the winter season set in the transportation problems had been greatly improved and the requirements for waterworks chemicals generally attended to, so that further difficulties were not experienced.

CONTROL OF INTERSTATE WATER SUPPLIES.

During the past fiscal year the control of water supplies used by common carriers for drinking and culinary purposes in interstate traffic has been carried out in cooperation with the State health departments in accordance with the policy of utilizing existing State health organizations to the fullest extent. Where a State sanitary engineering division does not exist or is inadequate, service assistance has been rendered as far as possible with the twofold object of instituting and developing such divisions in State health departments and of making inspections and analyses of interstate carrier water supplies to obtain the necessary data for certification. To make the control over these waters more effective the United States has been divided into nine districts and a service sanitary engineer assigned to each as far as available funds have permitted. Through such an organization closer contact has been established with each State health department and a more thorough supervision has been exerted over the interstate carrier waters, the sources of supply, and methods of handling at terminals and stations.

Efforts have been made to obtain more complete information from more than 900 railroads as to the sources and ownership of all water supplies used for drinking and culinary purposes in interstate traffic, so that an accurate and complete list of such waters will be available. According to a decision regarding such water supplies a common carrier is subject to the interstate quarantine regulations of the United States if it is possible for a person to travel by that carrier and another carrier without unnecessary delay from one State to another, and the water supplies which are used for drinking and culinary purposes by that carrier are to be certified in accordance with the certification procedure. As a result of this decision the number of water supplies to be certified and the number of common carriers subject to the interstate quarantine regulations have been greatly increased.

Through the cooperation of the American Railway Association a closer contact has been established with the railroads, making possible a more effective control of the interstate carrier waters. It has been arranged in view of the magnitude of the project and present conditions that the drinking-water coolers on railroad cars now in construction or to be constructed will contain separate compartments for ice and for water so that the ice cannot come in contact with the

water, and that all coolers now on cars will be remodeled to comply with this requirement by July 1, 1924.

Despite the inadequate appropriation for control of interstate carrier waters it was necessary to extend this control to waters on vessels during the past fiscal year. Widespread disease outbreaks occurred in the summer of 1920 among the passengers of two excursion vessels on the Mississippi River. Upon investigation by Asst. Sanitary Engineer J. I. Connolly these disease outbreaks were traced to the use of polluted river water on the vessels for drinking and other purposes. Similar outbreaks due to the use of polluted waters have occurred on Great Lakes and river vessels in the past. Accordingly, all vessels operating in interstate traffic or between foreign ports on or near the frontiers of the United States and adjacent ports in the United States have been required to take water for drinking or culinary purposes from an approved supply ashore or to treat the water by an approved method on board before use. In the control of the vessel waters, certification is required of all water obtained from supplies ashore used for drinking or culinary purposes on board, similar to the procedure now in effect concerning interstate railroad waters, and in addition certification is required of the vessel water supply systems containing water for such use, the latter certificates being prepared by the district engineers of the United States Public Health Service after inspection by them. Waters obtained afloat which are used for drinking or culinary purposes on vessels are also certified to by the district engineers.

As a result of this control, apparatus for treating water have been installed on a large number of vessels, while improvements as regards the icing, storage, and methods of handling of water have been made on many others. The work involved is of such magnitude that additional sanitary engineering personnel and increased appropriations will be necessary for the next fiscal year to make this control of widespread effect.

The certification policy as adopted at the conference of State and Territorial health officers, June 4, 1919, was modified at the conference held June 3 and 4, 1921, to obtain a more effective and widespread control. The important revisions in the certification policy are:

1. A new certificate form is used which does not include data relative to field inspection and laboratory findings of water supplies.

2. A supplementary engineering report on each source of supply is to be furnished by the State health department with the certificate. This report is to include a description of the supply, method of development, and findings as to quality as determined by the State health department from field inspection and laboratory examination.

3. Certificates as prepared by State health departments are to be marked favorable or unfavorable. If a State desiring to qualify its indorsement submits a statement on the certificate giving specific reasons for such qualified indorsement, the Surgeon General of the United States Public Health Service may approve the use of the water temporarily if deemed advisable.

4. If a water supply is found to be unsafe by a State health department and disapproved to the city and improvements recommended by the department to insure the safety of the supply, the use of such water supply by a common carrier for drinking and culinary purposes in interstate traffic will be prohibited.

5. Placards stating that the use of an unsatisfactory water is forbidden will specify the governmental body condemning the supply, either the State health department alone or in cooperation with the United States Public Health Service as the State may deem advisable, and will be posted over taps at stations through the State health department.

The following table summarizes by States the data concerning the certification of interstate carrier waters during the fiscal year ending June 30, 1921:

Interstate carrier waters.

State.	Sources.				Certified.				Per cent sources uncertified.
	Municipal.	Private.	Railroad.	Total.	Satisfactory.	Poluted.	Provisional.	Delinquent.	
Alabama.....	36	3	5	44	25	3	.....	16	36
Arizona.....	29	8	18	55	9	.....	.....	46	84
Arkansas.....	36	8	25	69	13	3	2	51	74
California.....	49	24	31	104	37	1	37	29	28
Colorado.....	25	2	10	37	.....	.....	.....	37	100
Connecticut.....	27	5	4	36	15	4	1	16	45
Delaware.....	8	.....	1	9	4	1	3	1	11
District of Columbia.....	1	.....	.....	1	.....	.....	.....	.....	.....
Florida.....	44	18	16	78	23	.....	2	53	68
Georgia.....	69	4	4	77	39	10	1	27	35
Idaho.....	36	5	17	58	11	6	10	31	53
Illinois.....	68	13	24	105	52	1	1	51	49
Indiana.....	53	3	10	66	39	7	7	13	20
Iowa.....	55	3	18	76	14	.....	.....	62	81
Kansas.....	75	7	19	101	82	3	3	13	13
Kentucky.....	25	7	7	39	18	2	2	17	44
Louisiana.....	28	21	25	74	39	5	2	28	38
Maine.....	61	26	24	111	51	2	.....	58	52
Maryland.....	14	2	5	21	15	.....	.....	6	29
Massachusetts.....	44	.....	2	46	45	.....	.....	1	2
Michigan.....	78	24	33	135	99	6	.....	30	22
Minnesota.....	46	10	39	95	50	14	.....	31	33
Mississippi.....	29	9	17	55	37	2	.....	16	29
Missouri.....	42	12	28	82	23	3	6	50	61
Montana.....	21	2	8	31	21	.....	.....	10	32
Nebraska.....	30	.....	29	59	24	1	.....	34	58
Nevada.....	7	1	9	17	.....	2	.....	15	88
New Hampshire.....	25	2	.....	27	18	1	7	1	4
New Jersey.....	37	3	5	45	41	1	.....	3	7
New Mexico.....	11	.....	10	21	15	.....	.....	6	28
New York.....	111	12	16	139	35	9	12	83	60
North Carolina.....	53	25	16	94	52	5	6	31	33
North Dakota.....	16	27	14	57	51	2	1	3	5
Ohio.....	82	7	21	110	73	6	9	22	20
Oklahoma.....	42	5	19	66	15	9	2	40	66
Oregon.....	39	6	9	54	6	.....	27	21	38
Pennsylvania.....	126	23	17	166	72	3	1	90	54
Rhode Island.....	3	1	3	7	4	.....	.....	3	43
South Carolina.....	30	5	5	40	26	2	.....	12	30
South Dakota.....	23	.....	11	34	.....	.....	.....	34	100
Tennessee.....	33	10	15	58	26	10	5	17	30
Texas.....	94	18	70	182	5	1	120	56	31
Utah.....	8	3	4	15	8	.....	.....	7	46
Vermont.....	14	8	1	23	10	.....	9	4	17
Virginia.....	49	9	8	66	45	1	.....	20	30
Washington.....	34	2	17	53	12	2	2	37	70
West Virginia.....	24	12	27	63	40	6	8	9	14
Wisconsin.....	48	18	19	85	21	9	.....	55	65
Wyoming.....	12	.....	4	16	.....	.....	1	15	94
Total.....	1,950	413	739	3,102	1,309	143	339	1,311	42

During the past fiscal year only 58 per cent of the supplies have been certified, due to lack of personnel and appropriations in the Public Health Service and the various State health departments for carrying out this control. Since over 60 per cent of the waters used by interstate carriers for drinking and culinary purposes are mu-

nicipal supplies, the control maintained by the service has resulted in the correction of many defects in these supplies and in their general improvement in quality and safety.

The work carried out by the bureau in the control of interstate carrier waters in the various districts as established during the past fiscal year is given in the following pages:

DISTRICT I.—MAINE, VERMONT, NEW HAMPSHIRE, RHODE ISLAND, NEW JERSEY, MASSACHUSETTS, CONNECTICUT, PENNSYLVANIA, NEW YORK.

This district was established on September 15, 1920, with Asst. Sanitary Engineer A. E. Gorman temporarily in charge. Since November 1, Associate Sanitary Engineer Sol Pincus has been in charge.

During October and early November, Asst. Sanitary Engineer Gorman visited the States of Maine, New Hampshire, Massachusetts, Vermont, Rhode Island, and Connecticut, and conferred with the State officials concerning matters relative to the cooperative water-supply supervision. Many vexing or misunderstood points in connection with the certification procedure were cleared up. Several of these States upon request were given advice and assistance for the improvement of their general water-supply supervision. In Maine an arrangement for the complete bacteriological examination of samples from public water supplies was urged and agreed to by the State health officials. In New Hampshire and Vermont, as well as in most of the States of this district, the urgent necessity for more frequent field inspection of the public water supplies was pointed out as of prime importance to the public health of the State. A number of public water supplies were inspected in cooperation with the State health officials.

Visits were also made to the headquarters of railroads for clearing up any misunderstandings relative to the Federal and State supervision of the water supplies used for drinking and culinary purposes in interstate traffic. Inspections were made of the conditions under which water from a certified source was handled in supplying coaches, Pullman cars, and diners at the Exeter Street yards at the Boston & Albany Railroad terminal at Boston.

The work was extended similarly into the remaining States comprising this district. Conferences were held during November with the State health departments of New York and New Jersey, and later with Pennsylvania, and their cooperation in the certification of water supplies made more effective. A satisfactory arrangement for the certification of the supplies in New York State was developed for the first time since this general supervision has been inaugurated.

MILK SUPPLY AND WATER SUPPLY FOR SERVICE HOSPITAL AT NEW HAVEN, CONN.

Upon request from the officer in charge of the United States Public Health Service Hospital No. 41, Associate Sanitary Engineer Sol Pincus made an investigation of the milk-pasteurization plants at New Haven, Conn., with special reference to securing a suitable milk supply for the hospital. As the plants handling milk in that city were found to be generally unsatisfactory from a sanitary view-

point, the matter of better supervision of these milk plants was taken up with the State health officer of Connecticut.

An investigation of the source of the water supply furnished to the service hospital at New Haven was also made by Engineer Pincus and a report of the prevailing conditions with recommendations was submitted. The water supply was found to be generally safe and under careful and intelligent supervision.

HANDLING OF DRINKING WATER AT RAILROAD TERMINALS.

Much emphasis was placed in this district on the methods of handling water from an approved source for drinking and culinary purposes by the railroad, and inspections were made of a number of railroad terminals, including those at Boston, Concord, N. H., New Haven, Conn., Albany and New York City, N. Y., Jersey City and Trenton, N. J., Pittsburgh and Harrisburg, Pa. At most of the terminals visited in these cities, reasonable attention and care in the handling of the water and the steaming of the containers was observed, but at some of the terminals gross carelessness and negligence was discovered. These inspections showed most convincingly that much study and investigation is required in the improvement of the facilities and means used in handling the water and containers in order to provide sanitary and economical methods. For furthering this experimental study of the handling of water supplies at terminals, the various railroad officials were strongly encouraged to make individual efforts at terminals under their supervision to obtain a better system for the steaming of water coolers, the protection of hose and water connections, the handling of ice, et cetera. Such attempts at improved methods are now being undertaken by many railroads in this district.

The most serious case of negligence in the railroad handling of drinking water was discovered at one of the large railroad terminals at Pittsburgh. Here it was found that three private sources of water supply were being used and that the drinking water placed on Pullman cars was unpurified river water. This practice was immediately discontinued and orders to that effect given by the railroad officials.

IMPROVEMENT OF WATER SUPPLIES DISAPPROVED FOR CARRIERS.

In some instances visits were made at the request of the State health officials to cities in which the public water supply had been condemned for use by carriers, as at Rutland, Vt., Norwich and Wilimantic, Conn., Woonsocket, R. I., and Salem, N. J. The observance by the carriers of the discontinuance of the supply and placarding orders was noted and compliance secured. An inspection of the water supply with local officials and a review of the report of the investigation and recommendations of the State were regularly made. In every case, prompt improvement of the public water supply followed upon the visit and conference with the officials.

Inspections were made of a number of other water supplies, not disapproved for use by carriers, and in many cases important points

for the improvement and better protection of the quality of the water supply, as gained from the practice and experience of other States, was brought to the attention of the State and local officials. Very cordial cooperation was obtained from the health departments of the States in this district.

WATER SUPPLIES ON VESSELS.

Early in 1921, and also during the previous fall, data were collected as to the manner and condition under which water is handled on vessels, the lists of vessels in this district, and the sources from which water supplies are taken. The methods for placing the drinking water aboard vessels, and for storing and circulating the water on the boats were particularly studied, and the views of shipping officials regarding possible sanitary improvements and supervision were ascertained. Following the adoption of a definite policy for vessel water-supply supervision, steps were promptly taken to place the procedure into practice, and the various State officials in this district were informed as to the policy.

The vessel companies in this region were circularized to secure current data on the sources of water supply for their boats. Inspection of the water supply systems on these vessels was then commenced, emphasis at first being placed on vessels engaged in excursion and coastwise or river passenger service. In the three months following the establishment of the vessel water-supply supervision the water-supply systems on 85 vessels were inspected, including nearly all the important river and coastwise excursion boats.

The vessels in this region generally secure their water for drinking and culinary purposes from sources of water ashore, so that the public-health requirements applicable are to have only approved sources of water supply used and to have proper facilities and care for the handling of the water aboard the vessels. The main features of the problem have been to require a separate hose for the exclusive use in filling drinking-water tanks, to require complete separation of drinking-water systems from other water systems on vessels, and to have the cooling ice separated from drinking water. The ready compliance by the vessel companies with the recommendations made for sanitary improvements following the inspections has been most gratifying. The interest and cooperation of the vessel operators in safeguarding the drinking-water supplies has been hearty and very helpful. About fifty passenger vessels have made corrections by separating the drinking-water system from the general circulating water system, provided separate hose for filling drinking-water tanks, or cooling arrangements whereby the ice and water do not come into contact. A general requirement for the regular weekly draining and flushing of all drinking-water storage tanks has been favorably accepted by the vessel companies and is being carried out carefully.

Again, as in the case with the railway water supplies, the most serious case of neglect of sanitary precautions for providing drinking water for passengers was encountered on a passenger vessel at Pittsburgh, Pa. A large excursion boat, steamer *Homer Smith*, was found to take water from the Ohio River, and this water being passed through a small, inadequate, and poorly operated pressure filter was distributed throughout the vessel for drinking. This

river water is very heavily polluted. For washing the filter the raw river water was used. The raw river water was also used for cooking and washing purposes. Two days previous to the inspection of the vessel, a member of the boat's crew, sick with a case of fully confirmed typhoid fever, was taken to the hospital. The history of this case pointed conclusively to infection derived from the boat. Immediate measures were taken for the discontinuance of the use of river water, for the disinfection of all water and containers on the vessel, and for the use of water from the Pittsburgh public water supply on this vessel. A permanent installation of large sanitary storage tanks for holding water from the Pittsburgh public supply was made at once. Other vessels in the region about Pittsburgh were found to follow very insanitary practices in securing their drinking water, and corrections were promptly taken up with them. The very dangerous practice of using river water for drinking, culinary, or washing purposes was ordered discontinued. Later, inspections of a number of the vessels disclosed that they were equipping themselves for using water from approved sources ashore.

NEW YORK CITY PUBLIC WATER SUPPLY.

The public water supply for the city of New York had been regularly certified for use by interstate carriers by the New York City health department, but when cooperative arrangements in the certification procedure were established with the New York State health department it was found advisable that the data and recommendations for the certification of this city supply should be furnished by the State. After several conferences with the State officials concerning this subject, Engineer Pincus, with the endorsement of the State health officials, made an investigation of the sanitary features of the New York City water supply.

Several important phases in the protection of the quality of this public water supply were found to be unsatisfactory and not in full compliance with justifiable sanitary procedure. The detail weaknesses in the safeguards to this supply were then pointed out to the State and city health officials and to the city water department. Further discussions were held with the city officials toward the close of the fiscal year, when the recommendations of the State and service engineers were accepted by the city water department officials. The principal recommendations provided for were:

1. Greatly increased rate of application of chlorine for disinfection of the supply with automatic control of chlorine dosage.

2. Prompt steps to be taken by the city water department to reduce the extent of pollution entering the impounding reservoirs (*a*) by the construction of sewers and intensive sewage-treatment facilities at the more thickly populated places on the Croton and Catskill watersheds, (*b*) stricter enforcement of the watershed regulations against pollution, (*c*) making chlorination of Esopus Creek, the principal source of supply for Ashokan Reservoir, more effective and reliable.

3. Full protection for distributing or secondary reservoirs by the construction of man-proof fences if feasible or else the chlorination of the flow from these reservoirs.

4. An intensive study of the features of the chlorination of the New York City supply with respect to variations in required rate of application and to possibilities of odor and taste.

5. Analytical tests performed on the water supply for control purposes to conform with standard procedure for such tests.

DISTRICT II.—DELAWARE, MARYLAND, VIRGINIA, WEST VIRGINIA, NORTH CAROLINA, SOUTH CAROLINA, DISTRICT OF COLUMBIA.

This district was established on September 28, 1920, with Asst. Sanitary Engineer I. W. Mendelsohn in charge. Upon receipt of request from the State health officer of Delaware surveys of the 26 public water supplies in the State were made. Samples of these waters were analyzed chemically and bacteriologically by the service. The local officials were informed as to the improvements to be made to safeguard the public water supplies. A detailed report was made concerning each supply, with recommendations for adequate State supervision of the public water supplies to insure safe and satisfactory waters. The State board of health was also assisted in the certification of water supplies used by common carriers for drinking and culinary purposes in interstate traffic.

Conferences were held with the State health officers and State sanitary engineers in this district concerning the cooperative certification policy, various matters being clarified pertaining to the railroad waters and the supervision of water supplies on vessels. As a result of these conferences a more effective supervision over the interstate carrier waters was obtained.

Several vessels were inspected concerning the drinking and cooking water supply systems and data obtained regarding the bureau policy for their supervision. After such a policy had been determined a list of vessels operating in this district was compiled and information obtained from the companies regarding the water supplies used and the vessel water systems. Temporary certificates were sent 43 vessels and other information was sent 39 others.

Assistance was rendered at the bureau in the administration of the supervision over interstate carrier waters and of allied matters. The bureau policy of assisting the State health departments in developing their sanitary engineering divisions and coordinating the activities of these divisions was furthered by transmitting various bulletins and information on sanitary engineering matters to the State sanitary engineers and by distributing the weekly copies of Public Health Engineering Abstracts, which contain abstracts of articles on sanitary engineering subjects as noted in many foreign and domestic journals, reports, and bulletins. This service was found to be of such great value that it was extended to the service sanitary engineers and others, the mailing list containing about 200 names at the close of the fiscal year. In this manner the various State and service engineers are kept informed regularly of progress in sanitary engineering work in all parts of the world, thereby resulting in more effective sanitary work in every State.

DISTRICT III.—OHIO, INDIANA, ILLINOIS, MICHIGAN, WISCONSIN, ALL GREAT LAKES AND ST. LAWRENCE RIVER REGIONS.

This district was established on November 20, 1920, with Asst. Sanitary Engineer A. E. Gorman in charge.

An investigation was first made of the conditions under which water used for drinking and culinary purposes was being provided on vessels operating in interstate traffic on the Great Lakes. At the bureau conference concerning the vessel water policy the results of this investigation were reported and recommendations made for supervision and control over the sources of supply and handling of such water.

During the winter and early spring months, before the navigation season on the Great Lakes opened, investigations were made of the conditions under which the drinking water supplied to trains operating in interstate traffic was being handled in railroad coach yards at Chicago. All of the 13 yards in the city were inspected, and where insanitary features or practices were noted recommendations for changes were made.

In order to explain the new policy of the bureau with reference to control over drinking water used on vessels, and to enlist their cooperation in connection with putting into effect the new water-supply regulations, conferences were held with State and local health officers and their representatives and also with shipping officials.

Because of the large number of vessels operating on the Great Lakes, it has only been possible to make inspections of the water systems aboard of but a small percentage of them to date. Special attention has therefore been given to the passenger vessels, because of their relatively greater importance. As the majority of freight vessel companies are represented in the Lake Carriers' Association, an effort has been made to accomplish results in connection with enforcing the new regulations through the cooperation of the officials of this association, rather than by directing attention to the individual shipping companies. Because of the depressed business conditions, less than 50 per cent of the freight vessels are in operation on the Great Lakes to date.

Cooperative arrangements have been made with the city health departments of Buffalo, Chicago, Cleveland, Detroit, and Milwaukee whereby samples of water will be taken from the drinking-water systems on all passenger vessels calling at these ports and bacteriological analyses made of same at city laboratories, and reports of analyses furnished to the district engineer weekly. In such manner the district office will be able to keep a close supervision over the sanitary quality of the water on all these vessels and to direct special attention to those ships needing same. Copies of these reports will be mailed to the operating companies monthly for their information.

Many of the apparatus for disinfecting lake water aboard vessels, before being used for drinking and cooking purposes, have been found on inspection to be out of adjustment or not properly operated, and it is doubtful if it will be possible to issue many regular certificates of inspection of water systems on vessels this season.

The following table gives information relative to the number of American vessels of different classes registered in the Great Lakes district and extent of the work accomplished by this district to date in inspecting these vessels and issuing temporary certificates:

Temporary certificates.

Class.	Vessels.	In-spected.	Issued.	Rein-spected.
Passenger.....	87	51	32	7
Freight.....	505	29	179	2
Barges.....	145			
Car ferries.....	20		3	
Total.....	747	80	214	9

As yet no inspections have been made of river vessels in this district. Canadian boats have been inspected when located at United States ports, but no action has been taken as a result of these inspections.

In connection with the duties of this district office relative to sanitary engineering problems of an interstate nature, conferences were held in April with the officials of companies operating passenger vessels calling at Cleveland, concerning the discharge of sewage from these vessels into the harbor water of this port. The shipping companies agreed to cooperate by locking all toilets on their respective vessels fifteen minutes before entering and for fifteen minutes after leaving Cleveland.

DISTRICT IV.—KENTUCKY, TENNESSEE, FLORIDA, MISSISSIPPI, ALABAMA, GEORGIA.

This district was established on February 1, 1921, with Associate Sanitary Engineer C. N. Harrub in charge.

In the month of February surveys of several water supplies in Kentucky were made in company with the State sanitary engineer. During March and April assistance was rendered the State Board of Health of Tennessee in the investigation of water supplies. Circular letters and notices were sent to the vessel companies regarding vessel water supplies and systems and a list was compiled of the vessels operating in the district subject to the regulations. Efforts have been made to get a complete and accurate record of all vessels at each port and to eliminate from the list the names of all boats not requiring inspections. Lists of vessels by ports have been made.

Conferences were held with the State health officers and sanitary engineers of all the States in this district and the control of interstate carrier water, both railroads and vessels, was explained. Inspections of water supplies were made at Vicksburg, Miss., and Mobile, Ala., upon request from the State health departments.

A summary of the work done regarding vessel waters and water systems during the latter part of the fiscal year is as follows:

	April.	May.	June.	Total.
Notices sent vessel owners.....	241			241
Masters' statements received.....	14	29	10	53
Temporary certificates issued allowing.....	14	29	9	52
Boats inspected.....		19	10	29
Certificates issued allowing.....		5	5	10
Certificates issued disallowing.....			19	19
Interstate water supplies inspected.....	19	2	4	25

DISTRICT V.—TEXAS, LOUISIANA, OKLAHOMA, ARKANSAS.

This district was established on April 1, 1921, with Associate Sanitary Engineer A. F. Allen in charge.

The principal work carried on by this office was assisting officers in charge of plague-control stations and in rat-proofing studies, the secondary functions being to assist State health officers in this district in the certification of railroad water supplies used in interstate traffic, and to certify water-supply systems on vessels engaged in interstate traffic.

Plague-control work consisted chiefly in the preparation of maps and charts and the collection and tabulation of various data obtained at the plague stations at New Orleans, La., and Beaumont and Galveston, Tex. These data were collected and drawings prepared by Junior Asst. Sanitary Engineer A. L. Dopmeyer. Conferences were held with the officers in charge of these plague stations and advice and assistance given in several instances. Limited field studies and extensive studies of literature have resulted in several reports on the subject of the effect of sea water on reinforced concrete as a problem of community rat-proofing.

The work of assisting State health officers in the certification of water supplies used by common carriers in interstate traffic was confined practically to the State of Louisiana. Fifteen inspections were made of local water supplies in that State by Junior Asst. Sanitary Engineer A. L. Dopmeyer, and reports on them were submitted to the State health officer. Conferences were held with the State health officers of the other States in the districts, and the certification policies were outlined. The possibility of assistance to be supplied in the future was also considered.

For the certification of water-supply systems on vessels a list of about 250 vessels was compiled, these vessels being enrolled at the ports of New Orleans, Galveston, Houston, and Port Arthur. All are engaged in coastwise trade, no certificates having been issued for vessels engaged in foreign trade. The necessary bureau form letters were sent to managing owners of these vessels and 42 temporary certificates of inspection were issued. In addition to this, inspections on six vessels were made and two permanent certificates of inspection issued, the others being held up waiting for reports of analyses of water necessary for the issuance of these certificates.

On April 16, 1921, a paper on "The Protection of Private and Public Water Supplies" was presented by Associate Sanitary Engineer A. F. Allen at a meeting of the Southwest Waterworks Association at Waco, Tex.

DISTRICT VI.—MISSOURI, IOWA, NEBRASKA, MINNESOTA, NORTH DAKOTA,
SOUTH DAKOTA.

This district was established on April 1, 1921, with Asst. Sanitary Engineer J. I. Connolly in charge.

Letters were sent to all known vessel owners within this district requesting information relative to the water used for drinking and culinary purposes aboard their vessels. Upon receipt of replies, records were compiled and forms were sent for affidavits to be executed by the masters of the vessels for the purpose of giving an authoritative statement of existing conditions pending the making of personal investigations. Upon receipt of these affidavits properly executed, temporary provisional certificates of inspection were issued for eight vessels.

Numerous visits were made to the St. Louis offices of the various steamer companies, especially to those having excursion steamers and passenger packets, to explain the service policy, advise as to how they could best meet the requirements and to secure their cooperation. The supervising inspector of the Steamship Inspection Service for this region was interviewed in regard to cooperation between his office and the service district engineer's office to avoid the duplication of effort in the steamer inspection work.

During April, conferences were held with the State health officer and director of the division of sanitation of the Minnesota State department of health, relative to the certification of water supplies used for drinking and culinary purposes in interstate traffic both by the railroads and by vessels.

Examinations of the Jefferson City and the St. Louis, Mo., public water supplies, both used for drinking and culinary purposes in interstate traffic, were also made in April upon request of the State health officer.

Assistance was also rendered the State board of health of Missouri upon request in various sanitary engineering matters. Attention was given to the construction of water and sewerage systems at Unionville and of sewerage systems at Joplin, Jackson, St. Joseph, Independence, and Excelsior Springs, Mo.

Inspections were made of seven vessel water systems during May and June.

Due to the lack of personnel and appropriations, District VII, comprising the States of Montana, Idaho, Washington, and Oregon; District VIII, comprising the States of California, Arizona, and Nevada; and District IX, comprising the States of Wyoming, Colorado, Utah, New Mexico, and Kansas, have not been established as yet.

SANITATION AND MEDICAL ASSISTANCE IN THE NATIONAL PARKS.

In view of the great danger of the spread of disease to all States through the hundreds of thousands of persons who visit the national parks annually and the lack of adequate sanitary facilities and medical attention in the park, the bureau upon the request of the Secretary of the Interior in the latter part of the fiscal year undertook to assist the National Park Service in providing the necessary medical attention and to improve the sanitary conditions in the

parks in accordance with investigations made by service engineers. The field work was placed in charge of Associate Sanitary Engineer H. B. Hommon with Junior Asst. Sanitary Engineers A. P. Miller and L. D. Mars, assistants. Acting Asst. Surg. W. E. Crawbuck was assigned to Yellowstone National Park to furnish the needed medical attention and to carry out certain sanitary inspections. A conference was held with the superintendent of the Sequoia National Park in regard to increasing the existing water supply, improving the sanitary condition of the privies and the collection of garbage. As a result garbage cans and a regular garbage collecting system will be installed, privy vaults will be disinfected with a spraying machine using cresol, and the water supply will be increased by constructing a dam across the creek which is the present source. Storage tanks will also be built at the main camp to collect and store water during the night.

A large scale map of the main camp grounds was prepared by Junior Asst. Sanitary Engineer Mars for the use of the park officials in locating campers during the summer, also for use in laying out a sewerage system and a disposal plant.

At Yellowstone National Park samples of water from the main sources were analyzed by the service engineers in a laboratory set up by them.

As soon as the examination of the water supplies was completed a detailed sanitary survey of the hotels and camps in the park was made and a report prepared.

It was found that the water supplies at the beginning of the season were, as a rule, satisfactory, but that the disposal of sewage from the hotels was very unsatisfactory; that the privies of the Yellowstone Camp Co. and in the Government automobile camps were very unsatisfactory; that the mosquitoes were so numerous and active that visitors were glad to get out of the park; that garbage in the Government automobile camps should be collected in cans and properly disposed of; and finally that a thorough inspection of all places serving food or drinks to either visitors or employees in the park should be made at least every two weeks.

The detailed work to be accomplished by Junior Asst. Sanitary Engineer Miller in Yellowstone National Park during the summer is as follows:

- (1) Prepare plans and estimates for sewerage systems and disposal plant for Government camps, Yellowstone Camp Co., and Yellowstone Hotel Co. at Old Faithful Junction.

2. Assist Yellowstone Hotel Co. in laying out a new sewer for their Lake Hotel and obtain necessary data for designing disposal plant, including sterilizing apparatus.

3. Measure sewage flow from Lake and Canyon Hotels to determine the capacity of sewage-treatment plants for these places and others of a similar character in the park.

4. Collect a second series of samples from all the water supplies in the park in July, and again in August if time permits.

5. Prepare estimates and plans for mosquito eradication at the hotels and camps where the nuisance was the greatest.

6. Assist the sanitary inspector of the park in locating water supplies for those automobile camps now without water except at long distances from the camps.

7. Accompany Acting Asst. Surg. W. E. Crawbuck on all inspection trips to the hotels and camps, the latter to include Government camps of all kinds. All reports of inspections to be signed by both officers and to be submitted in duplicate to the superintendent of the park.

The work to be accomplished by Acting Asst. Surg. W. E. Crawbuck in Yellowstone National Park during the summer is as follows:

1. Once in every two weeks, and oftener if necessary, visit all places in the park serving food or drinks to visitors or employees and make detailed report on sanitary conditions found. This work is to include kitchens, dining rooms, privies, toilets inside hotels and outside in the camps, handling of water in hotels and camps, and in general to note the sanitary condition of all places visited.

2. Visit the dairies or milk dealers and make complete inspection of premises. This work is to include instruction in regard to cleanliness in handling milk, with special reference to properly sterilizing milk containers. The care and attention of the sick among the producers and dealers is to be emphasized.

3. Inspect the unloading stations at the entrances to the park to learn whether proper methods of handling perishable goods are observed.

4. Obtain all the data possible relating to the cause of diarrhea or dysentery in the park. One or the other of these disorders or diseases has been more or less prevalent in this park as well as in all the other national parks in previous years, and it is the intention to collect data from all the parks in regard to this matter.

Junior Asst. Sanitary Engineer Mars assisted the Oregon State Board of Health in investigating interstate carrier waters prior to making certain mosquito investigations in Mount Rainier National Park.

TYPHUS FEVER EPIDEMIC IN NEW MEXICO.

On May 10, 1921, request was received from the Interior Department for service assistance regarding the outbreak of typhus fever among the Navajo Indians near Shiprock, N. Mex. About 40 cases of typhus fever had been noted, with 16 deaths, prior to this date. Service officers were immediately detailed to New Mexico to cooperate with the Office of Indian Affairs in instituting adequate control measures to prevent the spread of typhus among the 30,000 Indians over the entire reservation about 100 miles square, extending into Arizona and Utah.

Special field parties were organized with doctors, nurses, and attendants, and satisfactory delousing plants were set up, despite lack of equipment on the Indian reservation. As a result of the immediate institution of these effective measures, the spread of typhus fever was quickly checked. An intensive campaign is now in progress to eradicate typhus fever on the reservation.

SUPERVISION OF INTERSTATE CARRIERS.

The travel of diseased persons on common carriers in interstate traffic and the transportation of things from disease-infected localities, together with general sanitary conditions on the carriers, has been controlled under the interstate quarantine regulations as far as possible.

DIVISION OF FOREIGN AND INSULAR QUARANTINE AND IMMIGRATION.

The operations of the Public Health Service in the administration of quarantine stations and the enforcement of quarantine laws and regulations were conducted on the same general lines as formerly. During the year service officers inspected 28,016 vessels and 2,395,244 passengers and crews at the continental maritime stations. At border quarantine stations there were inspected, exclusive of the local inter-urban traffic, 64,056 travelers. There were detained 3,949 vessels, either because of disease on board or because the vessel came from an infected port, and 9,963 vessels were disinfected or fumigated. At foreign and insular stations the Public Health Service officers inspected 10,647 vessels and 1,280,094 passengers and crew destined for ports of the United States, and fumigated 1,470 vessels.

COMPLETION OF NATIONAL QUARANTINE SYSTEM.

Congress had made appropriation in the sundry civil bill of 1921 for the purchase of the New York quarantine station, the Baltimore quarantine station, and several quarantine stations that were formerly operated under the jurisdiction of the State of Texas. After a prolonged delay incident to perfecting of title and preparation of deed, the New York quarantine station was finally transferred to the National Government on March 1, 1921, and the Baltimore station was similarly transferred during April. While the referred-to stations in Texas are being administered by the Public Health Service under terms of a lease, transfer of the property has not yet been consummated because of the apparent inability of the authorities of the State of Texas to present satisfactory evidence of ownership of the land in question.

At the end of the fiscal year the Public Health Service had control of, and in operation, all quarantine stations in the United States and its insular possessions. Two or three small stations on the Texas coast, as above stated, are being operated under the terms of a lease, and the same status applies to the control of the quarantine station at St. Thomas. The old quarantine station located at East Point, in the vicinity of Charlotte Amalie, was utilized by the Marine Corps for several years after the transfer of the Virgin Islands to the United States Government. Later on the property was released by the Marine Corps and was taken over by the service for detention purposes, should such a quarantine emergency arise. With these exceptions, the Federal Government is in full ownership of all quarantine properties in the United States and insular possessions. At the end of the fiscal year there were under the control of the Public Health Service some 67 quarantine stations in the United States and Alaska, 3 in the Virgin Islands, 10 in Porto Rico, 8 in Hawaii, and 8 in the Philippines. Of this total number of stations, 35 can be rated as

first-class quarantine stations, with detention facilities, buildings, wharves, floating equipment, etc.; 8 can be rated as second-class stations as having Government-owned boarding facilities, but without reservations, buildings, or wharves; and 53 can be rated as third-class stations. This latter class will include those ports where there are no quarantine station reservations or property, where the inspection is performed either on a fee basis or by a part-time employee.

MEASURES AT FOREIGN PORTS.

During the year 35 medical officers were stationed at 32 foreign ports attached to the American consulates in those places for the purpose of supervising the enforcement of the United States quarantine regulations applicable to vessels and personnel departing for ports of the United States. The operations of service representatives at American consulates on the west coast of South America were of the greatest assistance in facilitating the movement of commerce and at the same time affording sanitary protection to the Canal Zone and ports of the United States engaged in trade with these South American ports, more especially with reference to the prevention of the introduction of plague and yellow fever. The operation of the service force in Europe was of the very greatest assistance in preventing the introduction of typhus into the United States through means of emigrants from typhus infected areas in Europe, and without the application of preventive measures at the European ports of departure for several months during the winter of 1920-21, trans-Atlantic travel would have been practically paralyzed.

MEASURES INSTITUTED AT EUROPEAN PORTS.

As mentioned in the annual report for the past two years, the bureau has been most apprehensive of the spread of typhus from certain areas of Europe to the United States whenever resumption of emigration should occur. It was well known that during the war there was a general breakdown, or, rather, disregard of public health measures in those parts of central Europe not actually occupied by military forces, and, furthermore, typhus was most prevalent in many of the military prisons and camps. Because of the restricted travel during active warfare there resulted a natural limitation of the spread of typhus throughout Europe, although the exchange of prisoners and movement of armed forces did result in more or less dissemination of the infection. On the cessation of hostilities and the resumption of commercial intercourse throughout Europe typhus increased both in the number of cases and infected localities, and as a consequence of the emigration to America throughout the fiscal year, more especially in the winter of 1920-21, the danger of the introduction of the infection into the United States was markedly increased. Fortunately, even before the armistice this condition of affairs was foreseen, and medical officers of the Public Health Service were sent to Europe for the purpose of investigation and to make preparation for the application of preventive measures at European ports of departure whenever trans-Atlantic travel should be resumed. In many instances, however, steamship companies failed to heed the warning of medical officers to be prepared, and there resulted an unnecessary

delay in the installation of appropriate disinfecting facilities at various European ports of embarkation. This was particularly the case at Danzig and, to a less extent, at some of the French and Italian ports. In the spring of 1920 Asst. Surg. Gen. Rupert Blue was assigned to the station at Paris in general supervisory charge of the service officers at various European consulates, and there were officers assigned also to the ports of Danzig, Rotterdam, Antwerp, Cherbourg, Brest, Barcelona, Hamburg, Havre, and Athens (Piræus), these in addition to those officers that have been stationed for a number of years past at various Italian ports. Later on representatives were assigned to Christiania, Goteborg, Copenhagen, Trieste, Constantinople, and eventually to the English ports of Liverpool, London and Southampton.

The occurrence of typhus on several trans-Atlantic vessels in the summer of 1920 was rather suggestive that a sharp increase of the infection would take place during the following winter, and this proved to be the case. As the winter progressed there was an increase of typhus infection on trans-Atlantic vessels and a very marked increase in the number of heavily vermin-infested emigrants arriving on vessels at ports on the Atlantic seaboard. Service officers, by the exercise of patience, great persistence, and by the employment of more or less resourcefulness, were able to secure a reasonably satisfactory enforcement of precautionary measures at European ports, but this was only of relative effectiveness because of the lack of equipment and facilities that should have been provided by steamship companies or local governments. Finally, in early January the department made request of the Department of State that American consuls in European ports refuse to issue bills of health to vessels unless typhus preventive measures should have been carried out to the satisfaction of the medical officer attached to the consulate, and quarantine officers at ports of the United States were instructed to exercise special care in the inspection of incoming vessels and to hold in detention for 12 days after the application of delousing measures the personnel on vessels arriving without a bill of health or without a bill of health which had been countersigned by a medical officer of the Public Health Service where such officer was available. The results obtained in preventing the introduction of typhus, with so little interference with travel, constituted a really laudable achievement.

In the early part of the fiscal year service officers were instructed to make careful inspection of travelers leaving on vessels for the United States and to require that those demonstrably verminous should be appropriately disinfested, with their clothes and personal effects. Detention at port of embarkation subsequent to delousing was not carried out in the early part of the year except with respect to those passengers known to have been in contact with typhus infected persons or premises. Later in the fiscal year, however, detention was imposed at European ports of embarkation against travelers from typhus-infected areas. When the detention was first put into effect it was contemplated that detention of 12 days would date from day of disinfection, but as the delousing measures became more efficient and the appearance of typhus amongst emigrants markedly subsided, the detention at the European port of embarkation was reduced so as to give credit for the time consumed in the trans-

Atlantic travel. While the situation was decidedly serious, it was by no means as alarming as the general public was led to believe through sensational press articles and the unwarranted concern of various local authorities. So misleading were many of the newspaper articles, that the impression became rather widespread that the louse was more or less an exotic insect, whereas the truth of the matter is, that in some of the larger cities of the United States pediculosis is quite as common in certain quarters as it is in Europe. For many years a very large number of emigrants from central Europe have arrived at the port of entry in an inexcusably unhygienic condition and with a very considerable percentage of them infested with vermin. As a matter of ordinary decency and personal hygiene, greater care should be exercised with respect to the personal cleanliness of emigrants departing from Europe for the United States, and it is believed that the experience of the past year will have a very beneficial result in that steamship companies have established and presumably will keep in operation at the European ports adequate facilities for bathing and disinfecting prospective emigrants. When typhus infection shall have subsided in Europe, as it eventually can be expected to do as a result of the sanitary measures taken, the verminous immigrant will no longer be a sanitary menace so far as typhus is concerned; but from henceforth it will be the policy of the Public Health Service to insist that prospective travelers at ports of Europe shall be reasonably clean at the time of embarkation, regardless of any known quarantinable disease to which they have been exposed. At ports of the United States typhus was detected on 10 vessels. With the exception of two vessels, the *Presidente Wilson* and the *San Guisto*, from Trieste, no secondary cases occurred on infected vessels, and it seems reasonably fair to attribute this condition of affairs to the preventive measures at the port of embarkation under the supervision of officers of the Public Health Service. Both the *Presidente Wilson* and *San Guisto* arrived in the early part of February at the port of New York from the port of Trieste. The resumption of emigration from Trieste was unexpected, and no service officer had been assigned to that port, and consequently no preventive measures had even been attempted. On arrival at New York, the *Presidente Wilson* had 4 cases of typhus, and during the period which the vessel and personnel were detained 17 additional cases developed. The *San Guisto* had, upon arrival, 6 cases, and 20 developed during the detention of contacts at the New York quarantine station.

There has never been any doubt as to the value of the application of preventive measures at the foreign port of departure, but if there ever had been the experience of the past year with respect to the prevention of the introduction of typhus would amply serve to prove the great value of such a system. In administrative efforts of this sort by the operation of widely distributed units, it can not be expected that all measures will be enforced with absolute efficiency, nor is it to be expected that mistakes of individual officers can be eliminated, but, taken as a whole, it can be stated that the function of the Public Health Service in foreign ports and ports of the United States in its effort to prevent the introduction of typhus during the past fiscal year, without at the same time crippling commerce, was a most notable success. The report of Asst. Surg. Gen. Blue will be reverted to later on in detail.

INTERNATIONAL SANITARY TREATY.

The majority of Governments signatory to the International Sanitary Convention signed at Paris, December 3, 1903, took appropriate action in ratifying the subsequent convention at Paris of 1912. Several signatories of the convention of 1903, however, have failed to ratify the convention of 1912, so that, with respect to these latter Governments, the convention of 1903 is still in force. In view of the more modern conception of sanitary subjects, the belief that the provisions of the sanitary convention at Paris of 1903 were distinctly inimical to the interests of this country, steps were taken to have that treaty nullified, and, as a matter of general interest and for the purpose of record, there is excerpted from the Congressional Record of May 26, 1921, the following:

INTERNATIONAL SANITARY CONVENTION.

In executive session this day the following resolution denunciatory of the International Sanitary Convention, signed at Paris, December 3, 1903, was adopted; and

On motion of Mr. Lodge, the injunction of secrecy was removed therefrom and from the papers accompanying the same:

Whereas the President, under date of May 17, 1920, transmitted a message to the Senate with a view to receiving the advice and consent thereof to the denunciation of the International Sanitary Convention signed at Paris, December 3, 1903, and proclaimed May 18, 1907: Be it

Resolved (two-thirds of the Senators present concurring), That the Senate advise and consent to the denunciation of the said International Sanitary Convention, in conformity with the reservation with respect to denunciation contained in the proces verbal of the deposit of ratifications thereof, with regard to the powers which are not parties to the International Sanitary Convention, signed at Paris, January 17, 1912, and proclaimed December 11, 1920.

To the Senate:

With the view to receiving the advice and consent of the Senate to the action desired, I transmit herewith a report by the Secretary of State, with an accompanying letter from the Secretary of the Treasury recommending that the International Sanitary Convention, signed at Paris on December 3, 1903, be denounced on the part of the United States for the reason that its provisions are inimical to the interests of the United States and because of the failure of the signatory Government to observe at least one of the convention's important stipulations.

WOODROW WILSON.

THE PRESIDENT:

The undersigned, the Secretary of State, has the honor to lay before the President, with the view to its transmission to the Senate to receive the advice and consent of that body to the action desired, a copy of a letter from the Secretary of the Treasury recommending that the international sanitary convention, signed at Paris on December 3, 1903, be denounced on the part of the United States for the reasons stated by him.

While the convention itself makes no provision for denunciation, the right to denounce it is reserved by the signatory Government in the proces verbal of the deposit of ratifications.

Respectfully submitted.

BAINBRIDGE COLBY.

DEPARTMENT OF STATE,

Washington, May 17, 1920.

TREASURY DEPARTMENT,

Washington, April 12, 1920.

THE SECRETARY OF STATE,

Washington, D. C.

SIR: I have the honor to recommend, if it meets your approval, that action be inaugurated to denounce the international sanitary convention signed at

Paris, December 3, 1903, ratified by the Senate March 1, 1905, and proclaimed May 18, 1907.

Subsequent to the signing of the referred-to convention at Paris, investigation into the factors involved in causing the dissemination of plague, cholera, and yellow fever made it evident that there were various features in that treaty that were wholly inadequate, and, furthermore, their application would not satisfactorily protect the ports of the United States against the introduction of such diseases from abroad. In view of these later developments of a sanitary nature, a new convention was drafted, containing modifications of the provisions of the sanitary convention signed at Paris on December 3, 1903, and was signed by the representatives of the various countries at Paris on January 17, 1912. This latter convention was ratified by the United States Senate on February 19, 1913. It was assumed at the time that the various other nations that were party to the formation of this treaty would later ratify it, but in some instances this has not been done, the referred-to nations, particularly Italy, preferring that the sanitary convention signed at Paris in 1903 should still remain in force.

In view of the more modern conception on sanitary subjects, it is believed that the provisions of the sanitary convention of Paris of 1903 are distinctly inimical to the interest of this country, and steps should be taken to nullify that treaty. As a matter of fact, the actual operation of the sanitary convention of Paris of 1903 never proved to be of any advantage to the United States, and has on several occasions been utilized to the disadvantage of this Government. For instance, article 1 of that treaty provides that—

each Government shall immediately notify the other Governments of the first appearance in its territory of authentic cases of plague or cholera. * * * The notification and particulars contemplated in articles 1 and 2 shall be sent to the diplomatic or consular offices in the capital of the infected country.

In so far as the records of the Public Health Bureau indicate, none of the countries signatory to the convention have complied with this obligation. On various occasions the local health authorities at some of the English ports have notified the consular officers of the occurrence of plague in the respective ports, but apparently even this method of conveying the information has not been observed in the continental countries of Europe. In 1911 there was a very severe epidemic of cholera throughout Italy, and several ports of that country have from time to time been infected with plague. There is no record that the Italian Government has ever made this information public, and this notwithstanding the fact that vessels arriving at ports of the United States in 1911 were repeatedly found to have cases of cholera on board.

The reservation made by this Government in the international sanitary convention made public February 26, 1913, made it possible for this Government to act for the prevention of the introduction of disease when reliable information is had of the occurrence of quarantinable diseases in foreign countries, and in this wise this country's interest does not suffer by reason of the non-notification of such diseases by other countries. The department is of the opinion, in view of the foregoing, that it is infinitely better to have no international sanitary convention than to continue to abide by the terms of the Paris convention of 1903.

During the conference of the international office of public health in Paris, October, 1919, Dr. Cumming, the representative from this country, in introducing certain changes desired in the convention of January 17, 1912, explained the reasons for the reservations made by this Government in ratifying this convention, as a result of which a resolution was passed unanimously that the representatives of signatory powers advise the respective Governments (which include Great Britain and Italy) to ratify the convention of 1912. Until such ratification shall have been made the convention of 1903 appears to be binding upon this country, and in view of present conditions in Europe imposes upon this Government restrictions which the Surgeon General of the Public Health Service considers dangerous and which prevent the enforcement of measures necessary for the prevention of the introduction of diseases from abroad.

Respectfully,

D. F. HOUSTON, *Secretary*.

GENERAL PREVALENCE OF QUARANTINABLE DISEASES.

Throughout the year there seems to have been an increased prevalence of bubonic plague. Although not reported by the Spanish Government, it was ascertained from an authoritative source that a very severe epidemic of plague prevailed at Cape Verde Islands from October, 1920, to March, 1921, and from other sources it was ascertained that the infection was present in the Canaries. In February, 1921, plague was reported in the city of San Juan, P. R., presumably introduced from the same source as was the infection in 1912, namely, Spanish vessels from Spain by way of either the Cape Verde Islands or the Canaries. As in the 1912 epidemic, the first cases were noted in the premises of persons engaged in handling commercial products obtained from Spanish lines. Prompt action on the part of the sanitary authorities, however, in Porto Rico appeared to have been successful in limiting the number of human cases, but at the close of the fiscal year the infection appears to be spreading to the various towns of the island.

In October, 1920, plague was reported at Tampico, the infection presumably having been acquired from Vera Cruz. From Tampico the disease proceeded inland to the towns of Cerritos and Carboniera, and possibly to other localities not reported. During the months of September and January the infection remained more or less latent, there being reported some three or four human cases. In February, however, due to some unknown reason, possibly the increase in flea prevalence and the extension of the epizootic, the number of human cases increased to an alarming extent and the various local authorities were not very successful in controlling the spread of the infection. In May the Mexican public health service informally requested the assistance in Tampico of a competent medical officer. Passed Asst. Surg. Carl Michel was thereupon assigned to duty at the American consulate at Tampico for the purpose of supervising outgoing restrictions pertaining to vessels bound for ports of the United States, and was also authorized, in so far as the above duties would permit, to extend all possible assistance to the Mexican authorities in plague-control measures. Shortly after his arrival, Dr. Michel established close contact with the Mexican authorities and was of the very greatest assistance in outlining and putting into operation an effective campaign for the eradication of the infection. New cases commenced to diminish, and shortly the epidemic will be under control; but it is not to be expected, with the conditions obtaining at Tampico, that the infection will be entirely eliminated at any reasonably early date; but, fortunately, the large bulk of shipping from Tampico is engaged in oil transportation, and these vessels take on their cargo at terminals well removed from the city of Tampico proper and oftentimes have no connection with the shore except through pipe lines. The usual precautions were enforced against vessels taking on cargo at the city wharves. With respect to the oil-carrying vessels, a service representative was authorized to make appropriate certification on the face of the bills of health whenever vessels were known to have taken on oil cargo at terminals well removed from the city of Tampico and in a relatively rat-free condi-

tion. Vessels in the latter class were passed without treatment at the American port of destination, and in this wise, without lowering sanitary safeguards in any respect, the great bulk of commerce at Tampico proceeded in an unobstructed manner. At the end of the fiscal year there have been 109 deaths in Tampico, with probably two or three times this number of cases. The plague infection continued at Vera Cruz, but was apparently well under control.

Various ports of the Mediterranean were reported as plague infected, and vessels sailing from ports of the Mediterranean are required to be fumigated upon arrival at the United States. On more than one occasion a report was received of the occurrence of plague on board vessels arriving at European ports from the River Platte, a locality which, for many years, has probably been a distributing point of plague infection. There was an epidemic of bubonic plague of moderate intensity in the city of Paris during the summer of 1920. Plague was also known to have occurred in Portugal and in Spain, although it was not officially reported by any of the respective governments at the time of its prevalence. Article 1 of the International Sanitary Convention was generally honored in its breach rather than in observance.

Various oriental ports continued to be plague infected, but at Hongkong there was a very noticeable increase in human plague in the latter part of the fiscal year. Systematic fumigation of vessels for the destruction of rats and the maintenance of ships as nearly as possible in a rat-free condition, as provided in the United States quarantine regulations, was enforced at the various quarantine stations during the year, and 6,598 vessels were fumigated for this purpose, some by sulphur dioxide, and others by cyanide gas. The observations made at the San Francisco quarantine station in respect to deratization of vessels, hereinafter reported, was especially interesting.

During the year cholera was reported in the Orient and in the interior of Europe, mainly in Russia, but thus far has not seriously threatened ports of the United States, nor is it apt to do so unless the infection extends to European seaports on the Atlantic or Mediterranean. Should this occur, it would not be difficult, with the number of officers assigned to American consulates in Europe, to enforce precautionary measures in the same general way as in 1911, when cholera was so prevalent in Italy.

Yellow fever was reported in the Yucatan Peninsula in more or less endemic form; but in Vera Cruz it assumed proportions of a severe epidemic. Passed Asst. Surg. Michel, who was at that time attached to the American consulate at Vera Cruz cooperating with the Mexican authorities in plague control work, was able, also, to offer most effective assistance, perfecting and putting into operation measures for the control of yellow fever. The preventive measures were fairly effective and no case was reported during the winter months, or in the spring of 1921; but there was a recurrence in the month of June. Senior Sanitary Engineer Le Prince was granted leave of absence from the service during December, January, February, and March, and carried out antimosquito measures in Tampico and vicinity. At the beginning of the active quarantine season of 1921, the percentage

of larvæ and pupæ was very low, and it was believed that if reasonable efforts were made to maintain conditions as they were when Mr. Le Prince completed his work on April 1, there would be no danger of a recurrence of yellow fever in Tampico during the active quarantine season. To a very great extent effective antimosquito work at Tampico was made possible by the financial assistance rendered for the work by the petroleum association. When they withdrew their support, however, in the latter part of the fiscal year, on account of the political situation and the discontinuance of the shipment of oil, there was a very decided increase in the breeding of mosquitoes, and in the early part of July three or four cases of yellow fever were reported. It is not definitely known from this report whether they were imported or indigenous. Until more definite data could be secured, the port was considered as yellow-fever infected, and appropriate measures were adopted to prevent the spread of the infection to ports of the United States. Yellow fever was also reported in a number of cities in Peru and in Brazil. Notwithstanding the various epidemics of yellow fever in Mexico, Central and South America, and the occurrence of the disease on ships entering ports of the United States, the infection has been successfully excluded from this country for the past 15 years. If the quarantine service has accomplished no more than this, it has many times paid the cost of its maintenance. The International Health Board has rendered assistance to the Mexican authorities in the reduction of yellow fever in Mexican ports and adjacent areas. It is noted, however, that in spite of four or five months of mosquito work at Vera Cruz, there were recurrences of cases in June, all of which afford additional evidence of the difficulty of effecting thorough control measures unless, on the one hand, martial law is proclaimed, or, on the other hand, intelligent cooperation be extended by the citizens.

Smallpox in its virulent type has seemed to prevail in Mexico, and to prevent the introduction of the more virulent strain of the disease into the United States, incoming travelers were vaccinated unless presenting evidence of immunity by recent vaccination or an attack of the disease. During the year 83,743 were vaccinated at different points on the Mexican border. In Jamaica there was a very extensive epidemic of a disease, which the service regarded as smallpox of a very mild type. The Jamaican authorities, however, contended that the disease was a physical entity which they designated as "alastrim" or "kaffir-pox." Tests and experiments made at the Hygienic Laboratory indicated that the disease was identical with smallpox. In order to prevent the spread of the infection into the United States, passengers and crews on vessels leaving Jamaica were required to be vaccinated.

QUARANTINE OPERATIONS ALONG THE MEXICAN BORDER.

Service operations at El Paso, Laredo, Eagle Pass, Brownsville, Rio Grande City, Hidalgo, Presidio, and Terlingua were carried out in the same manner as in previous years, and were directed chiefly against the introduction of typhus and smallpox, although all incoming travelers were subject to inspection, and due precautions were

exercised against the introduction of other quarantinable diseases. The only aspect of the Mexican border quarantine that is of serious concern is the opportunity that persons have for illegal entry at unguarded points at any time. The quarantine, immigration, or customs restrictions are sufficiently obstructive to travel at the ports of entry as to make the traveler feel compensated in taking the trouble of crossing the border at intermediate points. On account of the shallowness of the Rio Grande River during certain parts of the year, it is not very difficult for a traveler so desiring to effect an illegal entry above or below ports of entry, and until some arrangement shall have been effected for border patrol extending from Brownsville, on the Gulf, to Tia Juana, on the west, any prohibition against travelers from Mexico, whether it be of a quarantine, immigration, or customs nature, will be sadly lacking in effectiveness. The service has attempted to remedy the situation in some slight degree by providing mounted guards (automobile transportation) to patrol the river above and below Laredo, at which place has occurred in the past the greatest amount of illegal crossing along the border.

In order to curtail sanitary hazards along the border towns and to give further support to the measures in force to prevent the introduction of quarantinable diseases, the Public Health Service, in cooperation with the State health authorities, instituted campaigns in the Texas cities and towns along the Rio Grande to eliminate mosquito (*stegomyia*) breeding. The work was carried out under the general supervision of Chief Sanitary Engineer Le Prince and Asst. Sanitary Engineer Davis. Most satisfactory assistance and cooperation were extended by local authorities and citizens, and effective work was performed along this line. The fumigation of all freight cars coming across the Texas border seems effective against the introduction of plague. Aside from this, however, there is very little merchandise imported from Mexico to serve to attract or offer cover for rats.

Statistical data of quarantine transactions on the Texas-Mexican border for the fiscal year ending June 30, 1921.

Title.	Brownsville.	Eagle Pass.	El Paso.	Hidalgo.	Laredo.	Pre-sidio.	Rio Grande City.	Terlingua.	Total.
Number inspected from interior Mexico.....	8,233	4,492	15,041	6,025	29,590	427	247	11	64,056
Number local passengers inspected.....	499,297	671,775	1,899,937	11,740	520,864	6,535	9,247	3,316	3,622,711
Total number persons disinfected.....	172	11,754	67,908	43	3,459	.....	75	.....	83,411
Total number persons passed without treatment.....	507,348	664,513	1,847,070	17,462	544,568	5,861	9,172	3,298	3,599,292
Total number persons vaccinated.....	2,162	2,167	39,153	153	38,442	674	182	810	83,743
Total number of sick refused admission.....	68	.....	38	79	1,694	7	13	.....	1,899
Total pieces of baggage disinfected.....	3,753	15,022	7,288	40	11,278	183	99	.....	37,663
Number of cases typhus fever from July, 1920.....	.....	.....	.....	.....	1	.....	.....	.....	1

RECOMMENDATIONS AND PROSPECTIVE PLANS.

Recommendations included in the annual report of previous year are herein reiterated with respect to the necessity for a new quarantine station at Mobile and the acquisition of the quarantine station at St. Thomas, and the establishment of adequate quarantine facilities at Providence.

There is available for construction of a quarantine station near Mobile a site containing 12 acres of land, located on an artificial island in Mobile Bay, somewhat less than a mile from the city. The present station is situated some 30 miles from Mobile, at the entrance to the bay. It is built exclusively on piling, the buildings being connected by a series of gangways, and is of a type of construction that is exceedingly expensive of maintenance, causing frequent renewal of piling, and because of this, damage is occasioned almost every year by hurricanes. The upkeep of the station has been unreasonably high. The removal of the station to Sand Island, the above referred to artificial island, would prove not only more economical eventually but would add very materially to the efficiency of quarantine operations at the port. The present station practically serves no purpose other than as quarters for the medical officer and station force, although there is accommodation for the detention of a few persons.

The quarantine facilities at the port of Providence are wholly insufficient, and on several occasions during recent years it has been necessary to remand infected vessels to the port of New York. Such a procedure is, of course, prejudicial to the commercial interests of any port and always occasions resentment of local authorities because adequate facilities have not been provided to meet any quarantine emergency. There are a number of sites on Narragansett Bay and vicinity which would be most suitable for the construction of a quarantine station that would protect not only the city of Providence but also serve equally in handling the commerce that goes to Fall River and other ports in the vicinity of Narragansett Bay.

VIOLATION OF QUARANTINE LAWS.

During the fiscal year the department passed on 746 cases involving violation of the act of February 15, 1893, with respect to failure of masters to present American consular bills of health, and a total of 658 were dismissed without penalty because of the extenuating conditions, due in some instances to lack of American consular representative at the foreign port of departure, and in other cases due to the diversion of the vessel from the original port of destination on orders received on the high sea after the vessel had left port. The total amount of fines collected was \$11,375.

Transactions at national quarantine stations for the fiscal year ended June 30, 1921.

Station.	Vessels inspected.	Vessels fumigated.	Passengers and crews inspected.
Alexandria.....			0
Atchafalaya (Morgan City).....	0	0	0
Baltimore.....	1, 164	481	45, 938
Beaufort.....	0	0	0
Biscayne Bay.....	401	14	17, 512
Boca Grande.....	27	0	1, 001
Boston.....	812	124	107, 039
Brownsville ¹			8, 223
Brunswick.....	95	25	2, 206
Cape Charles.....	3, 500	1, 354	174, 420
Cape Fear.....	55	9	1, 873
Charleston.....	297	74	10, 551
Columbia River.....	103	69	4, 598
Coos Bay.....			0
Cumberland Sound.....	70	1	1, 267
Darien.....			0
Delaware Breakwater.....	50	0	1, 367
Eagle Pass ¹			4, 492
Eastport.....	346	0	27, 868
El Paso ¹			15, 041
Eureka.....	3	1	64
Fort Bragg.....			0
Freeport.....	101	5	2, 541
Galveston.....	1, 382	318	45, 085
Georgetown.....	9	0	90
Gloucester.....	18	0	120
Gulf.....	101	30	1, 704
Hidalgo ¹			6, 025
Honolulu.....	22	0	484
Ketchikan.....	171	0	7, 584
Key West.....	1, 356	21	89, 451
La Jitit ¹			8
Laredo ¹			25, 971
Marcus Hook.....	1, 463	392	78, 274
Minera ¹			0
Mobile.....	584	198	14, 207
Monterey.....			0
New Orleans.....	2, 530	125	116, 590
New Orleans City.....	0	1, 544	
Newport.....	6	0	162
New York.....	6, 378	2, 436	1, 326, 019
Pascagoula.....	41	11	416
Pensacola.....	825	676	5, 016
Perth Amboy.....	29	8	831
Port Angeles.....	40	0	263
Port Aransas.....	130	2	2, 100
Portland.....	146	21	9, 901
Port San Luis.....	14	0	536
Port Townsend.....	187	159	21, 409
Presidio ¹		0	427
Providence.....	177	0	26, 027
Rio Grande City ¹			247
Sabine.....	982	2 981	32, 097
St. Andrews.....	43	0	497
St. Johns River.....	309	38	8, 982
San Diego.....	1, 042	2	6, 161
San Francisco.....	730	678	93, 253
San Pedro.....	605	20	22, 760
Santa Helena ¹			3
Savannah.....	268	64	8, 764
South Bend.....	2	0	25
Tampa Bay.....	464	82	11, 077
Vineyard Haven.....	8	0	58
Zapata ¹			619
Total.....	28, 016	9, 963	2, 395, 244

¹ Border station. Statistics do not include "local" travelers, who, however, were subjected to cursory inspection. Through travelers were given close examination.

² Includes 631 vessels fumigated at Port Arthur in connection with outgoing quarantine.

REPORT OF ANNUAL TRANSACTIONS AT FOREIGN, INSULAR, AND DOMESTIC STATIONS FOR THE YEAR ENDING JUNE 30, 1921.

[Total¹ inspections: Vessels, 38,663; crew, 1,732,689; passengers, 1,869,596. Total personnel inspected, 3,602,285. Vessels passed on certificate of ship's medical officer, 817.]

Vessels detained for observation or treatment (detention for purposes of inspection only not included).

Nature of infection.	Yellow fever.	Rodent plague.	Human plague.	Small-pox.	Typhus.	Cholera.	Leprosy.	Total.
Vessels from infected ports ²	308	3,781	496	39	58	54	.....	4,736
Infected vessels ³	5	.....	1	34	15	1	7	63
Number of cases ⁴	3	.....	1	36	95	1	9	145
Number of crew detained.....	5,807	38	68	622	6,888	40	.....	13,463
Number of passengers detained.....	293	.....	147	32,329	38,389	233	1	71,392
Personnel disinfected.....	15	.....	147	32,642	33,861	683	.....	67,348
Personnel examined bacteriologically or vaccinated ⁵.....	.....	.....	.....	1,853	777	627	.....	3,257
Vessels fumigated: ⁶								
HCN.....	437	2,402	182	.....	16	.....	.....	3,055
SO ₂	154	3,953	103	12	3	5	2	4,232
HCN and SO ₂.....	.....	243	.....	.....	.....	.....	.....	243

Number of rats destroyed on ships, 34,026. Rats examined, 21,909.

¹ An inclusive figure regardless of treatment or report elsewhere.

² Refers to vessels held for observation when from an infected or suspected port, with no cases en route or on arrival.

³ Vessels with cases on board at arrival or reported en route.

⁴ Includes carriers.

⁵ Includes microscopic examinations of blood, excreta, tissue, etc.

⁶ Includes vessels fumigated after passing quarantine in accordance with provisional pratique.

Boston (Mass.) quarantine.—Post office and telegraphic address of this station is Gallops Island, Boston, Mass. Surg. William M. Bryan in charge.

During the past year Surg. Paul Preble reported for duty on June 16, 1921; Passed Asst. Surg. P. J. Gorman reported for duty on March 2, 1921; Asst. Surg. J. E. Faris reported for duty on March 10, 1921; Asst. Surg. (R.) H. B. Henry reported for duty on March 9, 1921; Acting Asst. Surg. B. H. Frayser reported for duty on April 3, 1921; and Administrative Asst. T. C. Armstrong reported for duty on March 24, 1921. Passed Asst. Surg. (R.) Montgomery, Acting Asst. Surg. Nelson, Acting Asst. Surg. Mestre, and Administrative Asst. Greeley assisted in the work for a short period during the month of February. This unusually large number of officers were on temporary duty owing to the prevalence of typhus among immigrants, which necessitated extra help. All have been relieved except Surg. Paul Preble, Acting Asst. Surg. Frayser, and Administrative Asst. Armstrong.

The officer personnel of the preceding year have remained on duty throughout this fiscal year.

The number of attendants was greatly increased during the months of February, March, and April, owing to the detention of passengers from typhus-infected areas of Europe at this station. A maximum of 150 attendants, including 25 female nurses, was reached.

At present the number of attendants employed is 35, including 4 nurses.

No new structures have been erected, but minor repairs to buildings have been made and considerable painting has been done. Addi-

tional painting of all buildings not painted during the last year is badly needed, and a number of the older buildings are badly in need of repairs.

The launch *Hugh Ward* was transferred to Providence quarantine station on November 28, 1920, and a new tug, the *Von Ezdorf*, was received from the builders on August 1, 1920.

The prevalence of typhus fever throughout central Europe, together with the arrival of a number of vessels from European ports, formed the outstanding feature of the year. The precautions taken against Italian ports continued, but additional restrictions were placed on travelers from all continental European ports early in the year, and this necessitated the examination of steerage passengers after disembarkment, the disinfection of those found to be infected with pediculi, and the detention for 12 days of those passengers on vessels whose bill of health showed insufficient precaution at port of embarkation.

The facilities at this station being inadequate for the detention of the unusually large number of persons on vessels diverted from New York, arrangements were made with the steamship companies and the city of Boston for the use as detention quarters of city institutions located on Deer and Rainsford Islands.

The facilities at this station were largely utilized for the bathing of infested persons, the sterilization of their clothing, and the hospitalization of the sick. Those subject to detention (which reached a maximum of 2,300 at one time) were isolated on Deer Island and Rainsford Island.

Brownsville, Tex.—Acting Asst. Surg. George D. Fairbanks, in charge, reports as follows:

The medical inspection and examination of arriving aliens has been carried on in conjunction with fumigation and quarantine work, as heretofore. The number of aliens inspected, 8,223, is almost double that of last year, and number certified for physical defect was 364. Four cases of leprosy were denied admission, which would seem to indicate a considerable focus among Mexicans. The medical officer has made 7 gynecological examinations of prostitutes for the Immigration Service, attended 2 sick aliens at the county jail, attended 5 sick men for the Coast Guard, and made 3 physical examinations for the latter. Very little venereal disease has been found, which conforms to observations made in previous years.

Cape Charles quarantine.—Post-office and telegraphic address of general office and boarding division, Fort Monroe, Va. Post-office address of hospital and detention station, Craney Island division, Box No. 1428, Norfolk, Va.; telephone, Holly 6502. Passed Asst. Surg. H. F. Smith in charge.

FORT MONROE DIVISION (BOARDING STATION).

The past fiscal year has shown considerable increase in the activities of this station, 3,500 ships having been handled, as compared with 2,604 for the previous year, an increase of 34 per cent over fiscal year 1920 and 113 per cent over fiscal year 1919.

Of these 3,500 vessels, 1,169 were from foreign ports which were infected, or presumably infected, with plague, yellow fever, typhus, or smallpox. In addition to these, there were 547 vessels arriving

from plague infected, or presumably plague infected, Gulf ports of the United States, making a total of 1,716 vessels arriving from infected ports, these vessels constituting 47 per cent of the total vessels handled.

A total of 1,354 vessels were fumigated during the year, as compared with 660 for the previous year, an increase of 105 per cent.

The necessity for these fumigations was as follows:

Vessels requiring fumigations on account of conditions of previous ports of call.....	935
Vessels fumigated under requirements governing periodic fumigation (par. 103, 1920 Quarantine Regulations).....	409
Vessels fumigated at request of other Government departments.....	6
Vessels fumigated at request of agents.....	4
Total vessels fumigated.....	1,354

An analysis of the figures shows that of the 1,169 vessels arriving from foreign ports where quarantinable disease was prevalent, only 192, or 16 per cent, took the necessary precautions to prevent the introduction of quarantinable diseases into the United States, while of the 547 vessels arriving from infected, or presumably infected, domestic ports on the Gulf, 529, or 96.7 per cent, were handled at the port of departure in such manner as to prevent the spread of quarantinable disease into other States.

As a result of the fumigation activities 15,065 rats and 51 mice were recovered.

Two vessels arriving had smallpox on board. One of these, arriving in the early part of the year, was remanded to the Baltimore quarantine station, after all persons on board were vaccinated, owing to the fact that the detention station at Craney Island had not been completed. In the case of the second vessel the case was removed to Craney Island and all on board vaccinated. Owing to shortage of available crew the personnel were kept on board the vessel at request of the agents for sufficient length of time to assure the protection of vaccination. Three persons not previously vaccinated and not having a successful vaccination at this time were removed to Craney Island and the vessel released after proper disinfection. The three members of the crew were revaccinated and at the end of seven days allowed to join their vessel at another port, after disinfection of baggage, etc., which had been removed from the ship.

One hundred and fifty-nine persons were vaccinated, of whom 109 were crew of infected vessels, the remainder being station personnel, pilots, customs officials, etc.

The personnel of ships' crews inspected numbered 157,511. In addition to these there were 16,909 passengers inspected, making a total of 174,420 persons handled at the station during the year, an increase of 44 per cent over the total handled for the year previous.

Transportation to and from vessels arriving at the station was furnished to the customs service for the year.

The hulk *Chase* was transferred to Newport News and entire hull from keelson to 18 inches above the water line sheathed with 1-inch creosoted lumber.

The boarding tug *Murray* was transferred temporarily to Baltimore quarantine for a period of five months.

The new boarding tug *McClintic* was delivered to the station by the builders in September, 1920. It was deemed advisable, however, to make certain alterations in this vessel prior to putting her into active commission. Upon the completion of these repairs the *McClintic* was transferred to the New York quarantine.

Upon the return of the *Murray* to the Cape Charles quarantine, plans and specifications and approval of same were obtained for the installation of a new boiler into that vessel and also approval for extensive repairs to hull and auxiliary equipment.

The launch *Plover* has been rebuilt and a new standard motor installed.

CRANEY ISLAND DIVISION.

(Hospital and detention station.)

The filling-in operations on the north side of Craney Island with dredgings from the deep-water channel to Norfolk, which operations are under the supervision of the United States Army Engineers, are still going on. Craney Island is now completely surrounded by a wooden bulkhead. The area of the section thus inclosed is approximately 320 acres; the area of Craney Island proper was originally approximately 27 acres.

The use of approximately 57 acres of the island, a portion of which is made land and a portion of which is part of the original island, has been granted to the United States Shipping Board under the terms of a revocable license by the Secretary of the Treasury for the purpose of erecting thereon a fuel-oil station for supplying fuel oil to the vessels of the United States Shipping Board. The station will embrace 20 tanks and have a total supply of 1,100,000 barrels of fuel oil. This allotted area is on the southeast corner of the island and has frontage on both the deep water of the Norfolk Channel and also on the new channel into the quarantine station.

The construction of the new bulkhead and wharf on the south side of Craney Island was begun on August 18 and completed December 24, 1920.

Dredging operations on the channel which connects the wharf of the Craney Island station with the deep water adjacent to the Norfolk Channel was started on February 19, the dredgings from this channel being pumped over the bulkhead and onto the lowland of the station. On February 22 the bulkhead gave way and it was necessary to suspend dredging operations for several days until an earth levee could be erected about the buildings for the purpose of retaining the material pumped in. The dredging of the channel was completed March 28. Approximately half of the bulkhead erected was abandoned, so far as the purpose for which it was erected was concerned. The new channel into the station is 100 feet wide and 8 feet deep, with a turning basin at the new wharf.

The hospital and detention station at Craney Island has been completed within the year. The final complement of bunks for steerage passengers and ship's crew has been installed and the quarters for cabin passengers and ship's officers fully equipped. The station is capable of handling 1,428 persons in detention in addition to those confined to the hospital. The barracks and quarters are complete and modern in every respect.

The hospital, which has a capacity of 28 ward beds and 8 rooms for isolation of cases, has been completely furnished. The hospital has been equipped with a complete laboratory, containing modern incubators, autoclaves, microscopes, stains, glassware, and supplies needed for chemical and bacteriological diagnostic work. A modern operating-room outfit, embracing surgical instruments, tables, sterilizers, etc., has been supplied. A drug room and dispensary are under construction at the close of the year.

The mess halls and kitchens for entire station have been completely equipped with dishes, glassware, ranges, cooking utensils, steam cookers, mechanical bread-mixing machine, potato parers, dish washers, and other mechanical labor-saving devices.

The seating capacity of the mess halls is 572 persons.

A modern delousing plant has been completed. The temperature of the delousing room for clothing, which is constructed with insulated walls, lead floor, and cypress clothing racks over each tier of which run perforated steam pipes, can be raised from room temperature to 210° F. in four minutes. The live steam is exhausted from the room at the end of each exposure by means of exhaust suction fans. Adequate facilities for undressing, inspection, bathing, and reinspection after bathing are provided.

A complete and modern steam laundry equipment has been furnished and installed.

The station is capable of being placed in commission to receive any number of persons for detention up to its maximum capacity within a few hours, and with its buildings and equipment for housing of detained persons, its hospitals, laboratories, laundry, spacious mess halls and kitchens equipped with modern apparatus forms a most valuable addition to the Government assets for the prevention of the introduction of quarantinable diseases into the United States.

Eastport (Me.) quarantine.—Acting Asst. Surg. John E. Brooks in charge.

During the year 346 vessels were inspected and passed, with a total of 27,864 passengers and crew.

The shipping at Eastport is almost exclusively confined to traffic with Canada.

No quarantinable diseases were observed during the year, but the nature of the traffic is such as to admit the introduction of physically and mentally defective aliens.

Diphtheria has been prevalent in the city during the winter and spring. Most of the cases were of a mild type, but there were several deaths.

Sixty-five physical examinations were made of war-risk insurance cases. These examinations of themselves constitute but a part of the work in connection with the compensation claims. Many letters have been written for the ex-service men in regard to their claims and compensation, form letters explained to them, and applications for State and National bonuses executed and forwarded. This assistance has been of the nature that is generally rendered by the Red Cross.

Marcus Hook (Pa.) quarantine.—Surg. H. McG. Robertson in charge.

The number of vessels arriving during the fiscal year just ended was about 200 greater than during the year preceding. In February,

1921, the passenger traffic to Philadelphia from foreign ports practically reached its pre-war level and continued so until June, when the immigration restrictive law, effective early in that month, practically put an end to passenger arrivals, except on a relatively small scale.

The necessity for delousing passengers found infested resulted in largely increased work at the station during the month of March, when two steamers from Naples with a total of 3,290 steerage passengers were held 12 days for the delousing of the passengers, and observation as to the possible development of typhus fever.

From February 24 to May 29, 12 other vessels were held at quarantine from 2 to 10 hours for the purpose of inspecting the steerage for vermin and for treatment of those found infested.

Since the receipt of instructions to fumigate vessels, even if from clean ports, once in six months, the number of fumigations has very markedly increased. Owing to the fact that the majority of vessels arriving at quarantine carry cargo, it has been found that the larger portion of this increased work falls on the Philadelphia force, where the fumigation is performed after the vessel is unloaded.

In November, 1920, the hulk *Lancaster* was sent to the New York quarantine station. This left the Delaware River quarantine short of detention facilities, but as soon as practicable thereafter the station at Marcus Hook was equipped with 564 new bunks, which provided an increased capacity of about 450. In addition the quarantine station at Delaware Breakwater was put in proper condition for detaining passengers by making numerous minor repairs and needed improvements.

At the present time it is possible to detain approximately 1,500 persons at the three stations on the Delaware River; that is, Marcus Hook, Reedy Island, and the breakwater.

On December 8, 1920, the steamer *Haverford* with passengers from Liverpool and Queenstown was held six hours for observation of a child suspected of having typhus fever. This case was determined to be measles, upon consultation, but was removed to the quarantine hospital.

No quarantinable diseases were found during the year.

Lake Sabine district quarantine.—Passed Asst. Surg. O. H. Cox in charge. Headquarters, Port Arthur, Tex.

Because of actual cases of bubonic plague in Beaumont and suspected cases in four other ports on Lake Sabine, it became necessary to establish outgoing quarantine procedures with close supervision over shipping alongside the wharves at various ports on Lake Sabine. Outgoing quarantine was initiated on July 7, 1920. While the shipping at Lake Sabine ports is rather extensive and includes vessels from all ports of the world, the bulk of the trade is with the Mexican ports and has to do more especially with oil and oil products. The various activities in the neighborhood were coordinated under the head of this office, and supervision was extended over the functions of the Sabine quarantine station, Port Arthur, Orange, Beaumont, and Port Neches. At each place a force of inspectors and fumigators was on duty. Vessels were required to be breasted off 8 feet, with rat guards on all lines, and fumigated for the purpose of the destruction of rats.

During the year 1,854 vessels from foreign and coastwise ports entered Sabine Pass, including tugs, barges, motor vessels, steam vessels, and sailing ships. During the first period fumigation was required each time a vessel cleared. As conditions improved, along about October 1, periodic fumigation was instituted, vessels to be fumigated not oftener than once in 15 days. On November 1 the interval was extended to 30 days, and in January to 60 days, and, finally, on March 30 the limit for strictly coastwise shipping was extended to once in three months. In addition to the fumigation crew already on duty at the Sabine quarantine station, a force of trained men was assigned to other ports on Lake Sabine. Fumigation by hydrocyanic-acid gas was employed at all places excepting Orange, where sulphur was used. At Port Arthur there were fumigated during the year 631 vessels, at Beaumont 285, at Orange 45, and at Sabine Pass 163. There were 1,846 bills of health issued, part to outbound foreign shipping and part to coastwise vessels.

While the force at Sabine Pass was mainly occupied with attention to incoming ships, the work at that place was more or less coordinated with the general activities of the district. In addition to the inspection of 1,028 vessels that entered Sabine Pass from foreign ports, 21,969 alien seamen were inspected for immigration purposes.

Mobile (Ala.) quarantine station.—Passed Asst. Surg. T. J. Liddell in charge; post-office and telegraphic address, Fort Morgan, Ala.

During the year 584 vessels were inspected, carrying a total of 14,207 persons. This represents an increase over the war years and might be said to have reached the normal.

The functions of the station were moved to Mobile, Ala., during the winter months, as the exposed position of this station makes boarding quite hazardous at times on account of the bad weather. Electric lights have been installed on the gangways, two new boarding launches authorized, and a marine ways built at this station.

While the former plan of establishing the station on an artificial island near the mouth of the Mobile River has not been abandoned, it has been postponed, but there is little doubt that later on such a practicable plan will be carried out. This will add to the convenience and efficiency of quarantine operations. The present station, moreover, is constructed on piling, which results in a most excessive cost for preservation and repair.

New Orleans (La.) quarantine.—Passed Asst. Surg. F. Faget in charge.

During the past fiscal year there has been an increase of over 57 per cent in the number of ships handled, 2,530 vessels being inspected as compared to 1,737 during the previous year.

A total of 116,590 persons were inspected, 105,501 seamen and 11,089 passengers, 3,756 seamen and 263 passengers being detained in quarantine from one to six days.

One case of yellow fever and two of smallpox were observed and removed from vessels to the station hospital for appropriate treatment and detention.

The medical inspection of arriving aliens was continued at this station during the year and 64,118 alien seamen and 3,888 alien passengers were examined, a total of 68,006 persons, an increase of more

than 43 per cent over the previous year, during which 47,424 persons were inspected.

Of the number inspected, 369 alien seamen and 26 alien passengers were certified in accordance with United States immigration laws and regulations.

New York quarantine.—Post office and telegraphic address, United States quarantine station, Rosebank, N. Y.; Surg. L. E. Cofer in charge; Passed Asst. Surg. E. W. Scott, executive officer.

The station passed from the control of the State of New York to the United States Public Health Service at the close of business on February 28, 1921, in accordance with conjoint action of Congress and the New York State Legislature. Reference will first be made to the conditions which prevailed from a quarantine view point, during that part of the fiscal year which the station was under State control, since this covers the greater part of the year's work, and during this period the port of New York was flooded with incoming immigrants from foreign seaports, practically all of whom were potential carriers of quarantinable disease.

STATE CONTROL.

TYPHUS FEVER.

A rigid system of examination was employed to guard against the introduction of typhus fever, and when inspection aboard ship showed louse infestation of passengers, the class infested were removed to Hoffman Island and deloused. Baggage of infested passengers was disinfected by means of cyanide gas.

CHOLERA.

Passengers arriving from localities where cholera was reported were removed to Hoffman Island for bacteriological examination of discharges prior to admission.

PLAGUE.

Vessels from plague-infected ports or ports suspected of plague infection were regularly fumigated in accordance with the instructions of the Public Health Service.

SMALLPOX.

Fourteen ships arrived during this period of the year with a total of 17 cases of smallpox on board. Seven of these cases were from Alastrim and, in the opinion of the health officer, were so-called West Indian smallpox, which has since been proven by Force and Noguchi to be a mild form of variola. Two other vessels arrived at the port on which cases had either died at sea or been put ashore at other ports before the vessel arrived at New York. A list of the ships on which actual cases were found on arrival follows:

Date.	Steamship.	Port.
1920.		
Aug. 11.	Princess May.....	Kingston.
Aug. 18.	Morro Castle.....	Habana.
Aug. 21.	Julia.....	Kingston.
Sept. 12.	Carrillo.....	Do.
Sept. 28.	Mobile.....	Liverpool.
Oct. 11.	Roma.....	Lisbon.
Oct. 12.	New Amsterdam.....	Rotterdam.
Oct. 13.	Castle Point.....	Kingston.
Dec. 15.	Fernando Palasciano.....	Naples.
Dec. 22.	Duca d'Aosta.....	Do.
1921.		
Jan. 5.	Braga.....	Lisbon.
Jan. 22.	Patria.....	Naples.
Do.	Iperia.....	Kingston.
Feb. 9.	Providence.....	Naples.

BILLS OF HEALTH.

Twenty-five vessels were detained in quarantine and their steerage removed to Hoffman Island for delousing and disinfestation of baggage, for the reason that they presented bills of health which were not countersigned at the port of embarkation by officers of the Public Health Service. This was due to the fact that the delousing and detention requirements were not carried out satisfactorily at such ports.

HOSPITALS.

Hospitals were maintained at both Hoffman and Swinburne Islands. Hoffman Island has a capacity of 150 beds in wards and Swinburne Island 100 beds in wards and isolation rooms.

UNITED STATES PUBLIC HEALTH SERVICE CONTROL.

The service took control of the station during an exceedingly busy time and when the rush of immigration was at its height. The measures inaugurated by the health officer of the State of New York as protection against the introduction of quarantinable disease, and particularly typhus fever, cholera, and plague, were continued under service control and the work was carried on smoothly and efficiently during the exceedingly busy months of March and April.

TYPHUS FEVER.

Additional boarding inspectors were placed on duty to guard against the introduction of typhus fever by means of louse-infested passengers and stricter measures were enforced in the delousing of infested passengers and in the treatment of baggage with cyanide gas. Ten ships were detained on account of typhus fever during this period and a total of 47 cases of typhus fever were treated in hospital; 23 of these cases were in hospital when the station was transferred to the service and the balance admitted later. One case was reported to have subsequently developed at Ellis Island, and at the request of the commissioner of immigration all detained aliens at the immigrant station were removed to Hoffman Island for detention and delousing.

CHOLERA.

Eleven ships were detained and 201 passengers removed to Hoffman Island for bacteriological examination on account of cholera. These cases were all negative.

SMALLPOX.

Two vessels were detained on account of smallpox. The cases were removed to hospital for observation and treatment, passengers and crew were vaccinated, and contacts detained. Neither of these cases were proven to be smallpox after observation.

PLAGUE.

Vessels from infected ports were regularly fumigated with hydrocyanic acid gas or sulphur. No ships were detained on account of plague.

LABORATORY.

The laboratory is modern and well equipped, and while it does all routine work for the station hospitals and work for physicians throughout the State, which is of interest from a quarantine standpoint, the main feature of the work during this period has been the examination of typhus fever suspects by means of a tentative Felix-Weil reaction. This reaction is done aboard ship and 734 suspects have been so examined since March 1, 37 of the reactions being positive.

The laboratory is at all times prepared to undertake the examination of swabs from the discharges of cholera suspects on a large scale and over 400 such swabs have been examined since the service has taken control of the station.

OTHER TRANSACTIONS, UNITED STATES QUARANTINE STATION, NEW YORK, N. Y.

Assistance has been extended to United States Public Health Service Hospital No. 61, Fox Hills, Staten Island, N. Y., by taking over part of their work pending arrangements for the establishment of a laboratory at the hospital.

PERSONNEL.

The personnel employed by the State of New York was taken over by the service completely, and Surg. L. E. Cofer, who had been acting as health officer of the port of New York, on leave from the service, took charge of the station as a Public Health Service officer. Passed Asst. Surg. E. W. Scott, Pharmacist B. E. Holsendorf, and Pharmacist John H. Hayes were assigned to the station slightly before the transfer in order to assist in the adjustment of the medical and administrative facilities to service methods, and Passed Asst. Surg. Carl Michel was detailed shortly after the transfer to take charge of the medical work on the island stations.

PLANT AND EQUIPMENT.

Since the Public Health Service has taken control of the station Congress has appropriated \$500,000 for improvements, and it is hoped that the work of enlarging the station facilities will soon be under way. The State has spent very little money on the station in recent years, but just prior to the transfer work was started on a new de-lousing plant which will shortly be completed at State expense. The buildings are all in poor condition and require extensive repair. The work of repairing and repainting has been actively pushed by the station force since the transfer and much has been accomplished. Four buildings on Hoffman Island have been completely repainted, new steam sterilizers installed for the disinfecting of clothing, a vacuum cyanide chamber purchased and placed in use for disinfecting baggage, and much repair work done on the mechanical equipment in general.

This work will be continued during the next fiscal year as far as funds are available.

One additional boarding tug, the *McClintic*, was assigned the station for duty and the steamship *Wadsworth* was taken out of commission on account of age and consequent cost of maintenance. The boats were all in fairly poor condition when received by the service and this has necessitated the expending of considerable money on them. The work of repainting the boats is being carried on by station labor and they will soon present a much better appearance.

Port Aransas (Tex.) quarantine.—Acting Asst. Surg. C. W. Skipper in charge. Post-office, telegraphic, and express address, Aransas Pass, Tex.

Subsequent to the destruction of this station by hurricane on September 14, 1919, no attempt has been made to restore it, and unless the shipping situation materially changes there does not appear to be any necessity for the reestablishment of detention facilities. A new launch, *Sea Parrot*, was provided for during the year, the engine from the old launch having been salvaged and overhauled at the factory and installed in a new hull.

During the year 130 vessels were inspected, and two of them fumigated by sulphur.

Portland (Me.) quarantine.—Acting Asst. Surg. Albert F. Stuart in charge.

During the fiscal year ended June 30, 1921, 129 steamers and 17 sailing vessels were inspected and passed. These vessels carried 1,389 passengers and 8,512 members of crews. Twenty steamers from cholera and plague infected ports were disinfected throughout for the destruction of rats and other vermin. Following the fumigations of these steamers, 71 dead rats were collected from various parts of these vessels and carefully examined, but no evidence of plague infection was found among them.

No quarantinable diseases were observed during the year. Owing to the prevalence of bubonic plague at Sabine, Tex., Tampico, Mexico, and other Gulf coast ports, 14 vessels were detained at quarantine and fumigated. Six steamers from cholera-infected ports were given the same treatment.

Port Townsend (Wash.) quarantine.—Passed Asst. Surg. Joseph Bolten in charge.

Twenty-four steamers were inspected and passed and 2 detained, and 15 sailing vessels were inspected and passed and 7 detained. One hundred and thirty-eight steamers and 7 sailing vessels destined for Seattle, Tacoma, and other ports were granted provisional pratique with the understanding that they would be fumigated at the final port of destination when empty, the service officers at these ports first being notified by wire or letter. One schooner was spoken and passed and two United States Government vessels were boarded and passed on the certificates of the ships' medical officers. These vessels carried a total of 13,909 members of crews and 7,500 passengers. The American steamship *Northwestern*, en route to Seattle from Alaskan ports, was boarded for the purpose of seeing a member of the crew ill with an eruptive disease thought to be smallpox. The disease in question was diagnosed as chicken pox and the health authorities at Seattle notified of same. All detained vessels were fumigated with sulphur-dioxide gas, by the pot method, for the destruction of rats and vermin. This work was done in the bay at Port Townsend. The United States Coast Guard cutters *Snohomish* and *Bear* were fumigated a number of times with cyanide gas for the destruction of cockroaches and rats, at the Diamond Point quarantine station. The Army mine planter *Major Samuel Ringgold* was fumigated with cyanide at the Fort Worden docks. No vessels were detained during the year at the quarantine station for quarantinable diseases.

One leper is still under treatment at the station. A second leper patient was released in August upon the request of the commissioner of immigration of Seattle. This patient was subsequently deported to her home in Austria.

The launch *Wightman* was towed to the quarantine station at Astoria, Oreg., during the month of August for use in boarding vessels at that port.

The fresh-water supply of the station was augmented by the addition of two 10,000-gallon redwood tanks. Considerable damage was done to the wharf by the Coast Guard cutter *Bear* during a severe southeasterly storm. The frequent number of southeasterly storms during this last winter has severely damaged the approach to the wharf. An electric-light system, boiler, warehouse, and shed on the wharf are urgently needed to put the station in a first-class condition.

Presidio (Tex.) quarantine.—Acting Asst. Surg. W. C. Moore in charge.

This port of entry is situated on the Texas-Mexican border, on the Rio Grande, and is about midway of what is termed the Big Bend district.

Shortly after September 1, 1919, the date the State border quarantine service of Texas was taken over by the United States Government, there prevailed an epidemic of perhaps 50 cases of smallpox in the neighboring town of Ojenaga, Chihuahua, Mexico. During this time the present medical officer was placed in charge. Up to the close of the fiscal year ending June 30, 1921, there has not prevailed another case of this disease.

As regards typhus, a continuous search for lice during the routine inspections has been kept up, owing to the prevalence of typhus in

some points in Mexico and in an Indian reservation in the State of New Mexico. So far no lice have been noticed. In the meantime, however, in accordance with communications from the Surgeon General and State Health Officer Carrick, of Texas, it is the desire of the medical officer in charge, by cooperating with local authorities, to carry out plans which it is hoped will ultimately lead to the establishment by the inhabitants of real sewerage, bathing facilities, and residences of better construction as regards sanitation. It is the opinion of the writer that most of these improvements would come simultaneously with the proposed connecting of the gaps in the Kansas City, Mexico & Orient Railroad, extending from Kansas City to the Pacific coast.

During the fiscal year there have been 427 travelers from the interior of Mexico and 6,535 local passengers inspected. There have been 674 persons vaccinated and 183 pieces of baggage disinfected.

Providence (R. I.) quarantine station.—Surg. H. G. Ebert in charge.

During the year ending June 30, 1921, 177 vessels were boarded for quarantine inspection, as follows: Steamers 154, sailing vessels 11, barges 12. One vessel, the French S. S. *Roma*, October 10, 1920, with 123 crew and 956 passengers, was remanded to New York quarantine station on account of smallpox, detention facilities being inadequate at this station. A total of 8,117 crew and 17,875 passengers and 35 stowaways subject to quarantine inspection arrived at this port during the year. Of these 123 crew and 956 passengers were remanded to New York, as above stated.

The only quarantinable disease found was one case of smallpox. Of communicable diseases not quarantinable one case of paratyphoid fever and four cases of mumps were reported to the local health authorities.

Quarantine transactions show an increase of 113 per cent over last year, which was the largest in the history of the station, when 83 vessels were boarded, and an increase of 342 per cent over the average of all previous years. This gain is due to the increasing number of oil vessels from Mexican ports and ports of the Sabine Lake district of Texas, and this seems to be of a permanent character.

No vessels were fumigated, as this was attended to and certified at other ports.

Reedy Island (Del.) quarantine station.—Post-office address, Reedy Island, Del.; Administrative Asst. Charles N. McMunn in charge, under supervision of Surg. H. McG. Robertson, in charge of quarantine system on Delaware Bay and River.

This station has been held in readiness during the year to care for vessels that might be remanded from the boarding station at Marcus Hook, Pa., for disinfection, and detention of passengers and crews.

No additions have been made to the detention capacity of the station during the year. The present capacity of 420 bunks and beds is not considered sufficient, and the erection of additional barracks to accommodate at least 1,500 persons is contemplated. The hulk *Lancaster*, formerly used as detention barracks, has been transferred to the New York quarantine station. This transfer was made owing to the immediate necessity at that station for additional detention facilities, and also the fact that it was considered inexpedient, in

view of the condition of certain portions of the hull, to keep the vessel any longer moored in deep water, exposed to the action of strong tides and floating ice.

During the year the new barracks have been fully equipped with the necessary bedding, kitchen and dining-room outfits, etc., and new equipment of the same nature has also been provided for the hospitals and quarters for crews. A small gasoline-operated electric-light plant has been installed as an auxiliary to the steam system. Many minor repairs have been made to the buildings, gangways, and equipment by the station force.

Rio Grande City (Tex.) quarantine.—Acting Asst. Surg. G. W. Edgerton in charge.

During the year substantial additions were made to the building here, consisting of one more room, porch, and painting of the entire building. The arrangement of this space provides for very efficient handling of persons crossing the river at this ferry.

Immigrant Inspector Roy L. Shults by his personal aid renders very valuable assistance in the expedition and thoroughness of the work of this office.

There have been no incidents of contagious disease in the district worth the name epidemic this fiscal year. However, the plague and typhus situation in Mexico has necessitated an extraordinary precaution which has been exercised as regards persons arriving from the infected districts.

The many problems presented by discharged soldiers have been worked out with the best of our ability and so far with reasonable satisfaction to all concerned.

Offer of cooperation with local health authorities has been repeatedly made.

The noticeable increase in local traffic is due to the number of entertainments and parties held by citizens of both nations in the "wet" district just across the river.

It is believed that from a comparison of the statistics in the report of last year and this that more people are attempting to cross at legal ferries, even though they may be excluded, the persons from the interior of Mexico last year being 581 with 17 exclusions; this year being 247 with 13 exclusions.

Sabine (Tex.) quarantine.—Acting Asst. Surg. P. H. Chilton, in charge, reports as follows:

This station passed from State control to that of the United States Public Health Service on September 1, 1919, in accordance with the terms of lease between the State and Federal Governments. In the sundry civil act of 1921, Congress provided funds for the purchase of Texas quarantine stations that were still owned by the State of Texas, of which number the Sabine station was one. Since September 1, 1919, Sabine has been operated as a national quarantine station.

It is located on Sabine Channel about 3 miles upstream from the Gulf and there inspection is conducted of all ships destined for Sabine, Sabine Pass, Port Arthur, Beaumont, Orange, and Port Neches. The majority of these vessels are engaged in the oil trade between ports in Mexico and the United States; a few carry general cargoes, and an average of 18 vessels a month lift cargoes of sulphur at Sabine.

During the fiscal year 1921, 982 vessels, with crews and passengers aggregating 32,097, were inspected, and of these, 216 were fumigated

with hydrocyanic acid gas, 3 with sulphur dioxide, and 2 with sulphur in holds and cyanide in superstructures. Medical inspection of alien seamen and passengers for the Department of Immigration, instituted at this station June 15, 1920, was continued during the fiscal year, a total of 20,033 alien seamen and passengers being inspected. Of these, 136 were certified to the Department of Immigration. No quarantinable disease was observed among passengers or crew of vessels during the year.

The facilities of Sabine station are inadequate for detention of crews and passengers. A building located directly on the channel is rented for use as storeroom and lookout tower, and office space is rented in the town of Sabine, about 6 blocks distant, where all administrative work is carried on. The only Government-owned building is the residence of the officer in charge. Work of papering and making much needed repairs to this building was begun in May and by June 30 was nearly completed, rendering the residence much more habitable and sanitary.

The launch *Willie Hobby* was placed in commission during the year and was returned to the station April 1, with new cabin and with factory-rebuilt engine, and has since rendered very good service. The launch *Everitt Sherrill* was laid up in the hands of a caretaker at Beaumont to await the installation of an engine and minor repairs to hull. The station is badly in need of this launch, and it should be placed in commission as soon as possible, as the *Hobby*, while excellent for use as a boarding launch and relief boat for the *Sherrill*, is far too small to efficiently and safely carry on the work of the station.

In view of the lack of detention facilities, it would be necessary, should the occasion arise, to remand an infected vessel to Galveston. The importance of the six ports for which inspection is done at Sabine is sufficiently great to justify the establishment of a modern quarantine station at Sabine with quarters for employees, detention barracks for crews, a landing wharf and protection for launches, administration building, etc., and a proposed site for such a station has been recommended at the request of the Surgeon General.

St. Johns River quarantine.—Acting Asst. Surg. F. R. Maura in charge. Post-office and telegraphic address, Mayport, Fla.

During the fiscal year ending June 30, 1921, 187 steam and 122 sailing vessels having a total gross tonnage of 733,349 tons, with a total in crews of 8,721 and 261 passengers, making a grand total of crews and passengers of 8,982, were inspected. The business of the station was double that of the previous year. No quarantinable diseases were found, and no vessels were detained, except for fumigation, all of which was for the purpose of killing rats and other vermin. There were 38 vessels fumigated, after which 150 rats were found, but the number killed was no doubt much greater, the total number not being found. Sulphur was used as a fumigant, 3 pounds per 1,000 cubic feet being used with a six-hour exposure. In connection with the management of the station there is one medical officer on duty who is in charge of the station, one attendant who is launchman and has charge of the fumigation under the supervision of the medical officer. One 25-foot launch

with 16-horsepower Standard engine is used for boarding purposes. For fumigating and disinfecting iron pots are used with galvanized tubs as water containers. All work relative to the station has been executed with very little difficulty. Vessels from infected Mexican and Texas ports are fumigated and are required to fend off from docks and use rat guards placed on lines midway between vessel and dock.

San Diego quarantine station, Point Loma, Calif.—Surg. J. R. Hurley in charge.

A total of 1,976 vessels entered quarantine during the year. Of these there were inspected and passed 1,942, with a total of 5,724 crew and 437 passengers. In addition there were 34 naval vessels boarded and passed, hailed and passed, or passed by radio on medical officer's certificates during the year, having a total crew of 7,784.

Two naval vessels were fumigated with sulphur dioxide by request for the purpose of destroying vermin. Twenty-four dead rats were found after fumigation.

No quarantinable diseases have been observed during the year.

There are approximately 11 acres of land within this quarantine reservation above high-water mark, and several more acres are embraced within the area covered by buildings, wharves, and gangways built on piles over the water. No new construction having been undertaken during the past year, the buildings and equipment stand as described in last year's report. A number of repairs and improvements, however, have been made to the station and its equipment, tending to increase its efficiency, during the year, among which may be mentioned the repairing and reinstallation of the 8-horsepower steam boiler and the four steam-jacketed cooking cauldrons in the detention barracks kitchen, the repairing of the sulphur furnace system of piping, the installation of a new flue to the shower-bath water-heating furnace, installation of gas cooking ranges in three buildings, the laying of 120 feet of new cement sidewalks, and certain repairs to the underpinning of the disinfecting wharf and gangways.

Cooperation has been rendered other Government departments as follows:

The Navy: Emergency medical and surgical assistance has been rendered sick and injured marines from the neighboring fuel depot and to enlisted men of destroyers and other small naval vessels lying alongside the Navy coal dock, upon request of their respective commanding officers, other medical assistance not being readily available in this locality. A total of 26 such cases have been given relief, including 3 cases of fractured bones and one incarcerated hernia.

Lighthouse Service: As in former years, permission has been accorded that service to store a few spare buoys on the end of the disinfecting wharf, and the acetylene flashing light and automatic fog bell installed on the wharf have been cared for and appropriately started and stopped by a station attendant.

Coast and Geodetic Survey: The tide gauge with automatic recording instrument housed in a small building near the boathouse has been cared for and the recorded readings transmitted to Washington by a member of the station personnel, as in preceding years.

This tide gauge was rebuilt during the year, and material assistance was accorded the Coast Survey officer ordered here for that work, as well as with the surveying work he carried out at the same time.

Interdepartmental Social Hygiene Board: A number of pieces of bedding were disinfected in the station at the request of the local field agent of that board.

San Francisco (Calif.) quarantine.—Surg. Frieuch Simpson in charge. Post-office and telegraphic address, Angel Island, Calif.

During the current fiscal year this station was concerned in the handling of the quarantinable diseases—smallpox, leprosy, and yellow fever, as follows:

Smallpox: On October 25, 1920, the steamship *President* arrived at this port at 6 p. m., from Seattle, Wash., entering under coastwise status, and in accordance with the regulations proceeded to the wharf. However, immediately prior to docking, a first-class passenger called upon the captain and suggested the fumigation of her stateroom before subsequent use. An investigation developed the fact that the lady was suffering from a mild case of smallpox. This patient had been exposed to smallpox in Seattle, but after vaccination and 17 days' observation she had been released by the health authorities in that port and on October 23 took passage on the *President* for San Francisco. She became slightly febrile and nauseated, which she attributed to seasickness. Later the eruption appeared as a small macule in the palm of the left hand, followed by another on the top of the head. She, with her husband, remained confined to their staterooms throughout the voyage. After notification of this case on arrival in San Francisco, the entire ship was examined, and in the absence of any disease resembling smallpox the steward's department was vaccinated, the personnel released, the compartment occupied by this patient fumigated with formaldehyde, the ship discharged, and the patient quarantined on Angel Island. Of particular interest is the fact that the disease did not manifest its presence until 17 days following exposure. Although unquestioned as to character, it was of an exceedingly mild type, and its discovery by the ship's officers was accidental. The vessel entering coastwise was not the subject of quarantine inspection.

On November 9, 1920, the American steamship *Bradford* arrived at San Francisco and anchored in quarantine. Previous telegraphic advice stated that a seaman, acting boatswain, discharged at Vancouver, British Columbia, had subsequently reported at the marine hospital, Seattle, where a diagnosis of smallpox had been made. From the evidence submitted, all members of the crew of the *Bradford* had been exposed en route, and the total personnel, numbering 38, was removed to the quarantine station for observation. The compartments occupied by the patient were fumigated with formaldehyde, the remainder of the ship fumigated with cyanide, a new crew supplied, and the ship discharged from quarantine. The personnel was held under observation to complete a period of 14 days, and no disease suggestive of smallpox having appeared they were released.

The American steamship *Ohioan* arrived at San Pedro on January 4, 1920; character of cargo, general; crew, 42; no passengers. Upon inspection on arrival, Quarantine Officer Van Voorhees discovered a case of smallpox in the steward's department. The diagnosis was confirmed by the local health officer at San Pedro. Under bureau

instructions, the case was isolated aboard, the crew refused liberty, and the vessel allowed to proceed to San Francisco for further quarantine treatment on arrival at that port. The vessel arrived at San Francisco on January 10 and anchored at 7:45 a. m., at which time the vessel was boarded and the personnel examined. The patient was found isolated, and the diagnosis of very mild variola vera confirmed. All members of the ship's crew had been previously vaccinated at San Pedro and all were well upon arrival in San Francisco. That portion constituting the steward's department, six in number, representing close contacts with the patient, were removed to the quarantine station, placed under observation, and subsequently discharged. The remaining number of the ship's personnel were released. The quarters and adjoining staterooms occupied by the patient on board ship were fumigated with formaldehyde, the remainder of the ship fumigated with cyanide, and the vessel allowed to proceed.

Yellow fever: The American steamship *Curacao* arrived at this port from Mazatlan and other Mexican ports at 5 p. m., Saturday, November 13, 1920. The personnel consisted as follows: Crew, 47; passengers, first-class, 9, third-class, 9. All personnel was present at muster, and but one case of illness was reported as having occurred en route; diagnosis, malarial fever; recovered. Upon muster and inspection, no person upon ship presented evidence of illness, and in the absence of evidence of disease or other circumstance warranting detention, the vessel was admitted to the port.

The following morning, November 14, in accordance with immigration laws and regulations, the alien steerage, consisting of 9 persons, was transferred to the immigration station for routine examination. This number included the person reported ill with malaria en route. This patient walked to the detention shed on the immigration station, and about noon on the 14th walked to the immigration hospital and reported at sick ward, complaining of nausea and gastric pain. He was admitted to the hospital ward, but apparently was not very ill. On November 16 slight jaundice was first noticed. At 1:15 p. m. on this day he developed convulsions of an epileptiform type, and shortly afterwards died. A blood specimen proved negative for malaria. A specimen of urine drawn shortly after death, showed a large amount of albumin. This patient boarded the vessel at Mazatlan, Mexico, at which port yellow fever had been recently reported. The passage from Mazatlan to San Francisco required six days. From the clinical symptoms presented, slow pulse, icterus, and albuminuria, together with the post-mortem findings, and the history of the exposure in a port where the disease had been reported present, the diagnosis of yellow fever was made.

Leprosy: In accordance with bureau instructions, there was received on this station, on November 19, 1920, a Filipino suffering from leprosy, en route from New York to the Philippine Islands. He remained on the station in isolation, under station care and observation, until November 30, when he was removed to the Army transport *Dix*, for transfer to the Philippine Islands.

Anthrax: In accordance with the revised quarantine regulations, June, 1920, especial effort has been made to intercept and properly fumigate in accordance with the regulations, consignments of shav-

ing brushes manufactured from hair or bristles. As a result, many consignments have been opened and inspected. Rarely shaving brushes have been found, under which circumstances the brushes have been fumigated at the quarantine station, and the material delivered to the consignee, or the material has been returned, as required, to the consignor.

Cooperation with military authorities: Semiweekly fumigations of infected clothing received from the hospital at Fort McDowell have been carried out.

Launch construction: During the current fiscal year there were constructed at a local shipyard, for the Public Health Service, two 60-foot 65-horsepower service launches, subsequently named the *Donald Currie* and *H. D. Geddings*, respectively. These vessels, of approximately 25 gross tons, under bureau instructions, were received, given a trial trip, and interned on the station. Subsequently they were fitted with pilot-house control, eliminating the need for an engineer. They are staunch, roomy, and of a character suitable to the quarantine needs of the average station. On March 1, 1921, the *H. D. Geddings* was transshipped via the canal to Savannah, Ga., for the use of the quarantine station at that port. The *Donald Currie* continues under station care, awaiting early transportation to Astoria, Oreg.

During the year, in addition to quarantine duties, quarantine boarding officers have assisted in the medical examination aboard vessels of all arriving aliens; 21,227 alien passengers and 40,450 alien members of crews, representing a total personnel of 61,677, have been inspected, of which number 606 alien passengers and 37 alien seamen were subsequently certified. In this connection it should be stated that this cooperative work consists in the certification of alien passengers or crew when an immediate diagnosis aboard ship can be made, or the detention of suspicious alien passengers or crew for subsequent medical observation when the condition present is suspicious but the presence of deportable disease can not be immediately confirmed. The subsequent care, examination, and disposition of the cases is under the direction of the Public Health Service officer in charge of the immigration hospital under the direction of the immigration authorities. A detailed report of the cases above certified is therefore made through his office.

Bubonic plague: The continued presence of bubonic plague in oriental ports and South American ports, from which vessels directly arrive, the gradual spread of the disease throughout the world, and the continued presence of the disease on the Gulf coast have kept prominently in mind the necessity for the careful and thorough destruction of rats upon vessels arriving in this port from plague-infected ports or localities suspicious for this disease. With the penetration of the disease inland to the Mexican towns of Cerritos and Carboniera, under instructions from the bureau, greater attention has been paid to vessels calling in at ports on the western coast of Mexico. Vessels from such ports which have visited the wharves, or otherwise exposed themselves, have been held for fumigation at the termination of each voyage, as is required of all vessels from oriental ports or other ports suspicious for plague or plague infected.

Of all the quarantinable diseases, bubonic plague is considered of first importance in connection with disease control and prevention.

The infrequent louse-infested individual in this community would minimize the spread of typhus. The presence of a modern sewage disposal system, with unquestioned drinking water from a protected source, would render the control of cholera practicable. The absence of the transmitting mosquito effectively prevents the spread of yellow fever. The means of anthrax spread is under control. Isolation and prompt vaccination will limit the transmission of smallpox. Leprosy is rare and of negligible importance. On the contrary, there is constantly open the avenue for plague introduction through the escape of plague rats from aboard ship to harborage ashore. Suitably planted, without knowledge of its presence among the rats, its spread continues unrecognized until of sufficient extent to result in a human case. Its control then becomes of great sanitary importance, requiring the cooperation of the entire community and the financing of an expensive sanitary campaign. With these facts in mind, all vessels entering this port have had their records carefully scrutinized, and all ports of call during the previous six months carefully considered. Fortunately, no vessel entering this port during the fiscal year was found plague infected or suspicious for this disease, and in all instances it has been practicable to allow cargo-laden vessels to discharge prior to fumigation. Vessels in ballast have been required to fumigate upon arrival. During the fiscal year, in accordance with this practice, 679 vessels have been fumigated for the destruction of rats, 598 being fumigated with hydrocyanic-acid gas, 80 with sulphur dioxide gas, and 1 with formaldehyde gas. These vessels represented a total space fumigated of 182,382,000 cubic feet, and required the use of 40,010 pounds of sulphur and 59,334½ pounds of sodium cyanide, the sodium cyanide being converted into gas by the use of 39,001¾ pounds of sulphuric acid. As a result, there have been obtained 4,377 rats, as follows:

<i>Mus rattus</i>	1, 402
<i>Mus alexandrinus</i>	2, 564
<i>Mus norvegicus</i>	20
Unidentified	391
	<hr/> 4, 377

In addition 1,056 mice were obtained.

Of this number of rodents, 2,448 rats were forwarded to the laboratory for examination. No plague-infected rats were found.

Of interest is the fact that among the number of vessels fumigated 33 have been request fumigations, indicating an increasing public appreciation of the value of fumigation. Cyanide gas continues the fumigant of choice. Sulphur, in fact, is now used only in cases where the use of cyanide is impracticable, by reason of the time of day or location of the vessel.

In continuation of the previous practice no relaxation has been permitted in the enforcement of measures necessary for the safe exposure of the vessels to cyanide gas. All personnel is removed ashore, and this fact certified in writing by the master. No one of this personnel is allowed to return until the vessel has been personally inspected by a medical officer and its safety certified over his signature. No fatality or serious exposure to the gas has occurred during the present fiscal year.

Since September, 1920, accurate records have been maintained, showing locations where rats were found dead after fumigations with cyanide. A compilation is transmitted herewith, the record indicating the nationality and rig of vessels, whether loaded or empty, and the tonnage, together with the number of rats found in holds, storerooms, galleys, crews' quarters, and other superstructures. Five hundred and two vessels are reported, a number sufficient to warrant certain deductions from the results obtained. Of the 502 vessels fumigated with hydrocyanic-acid gas 224 such vessels were found, upon search after fumigation, to be rat free. In the remainder, namely, 278, there were found after fumigation 3,079 rats. It is the common opinion that the majority of rats aboard ship are to be found in the holds, and that the fumigation of this portion of the ship covers the practical need. The report is therefore of interest in disproving this opinion, for it should be noted that of the total of 3,079 rats found, only 1,377 were obtained in holds, whereas 1,702 were found after fumigation in other portions of the ship. It seems very clearly established then that at least 50 per cent of the rats found aboard ship will be found in compartments other than holds, and stresses the importance of fumigating upper works. Further, ordinarily one would expect to find the bulk of the rats outside of the holds located in the galley, the storeroom adjoining, or the crew's quarters, whereas, according to this report, storerooms, galleys, and crews' quarters collectively account for 819, leaving 883 in compartments other than galleys, storerooms, or crews' quarters. It would therefore seem correct to say—

1. One-half of a ship's rats will be found outside the holds.
2. One-half of the rats outside the holds will be found in compartments comprising forepeak, steerage deck, chain locker, and storerooms.

Cargo vs. ballast: Ordinarily it is assumed that the proper time to fumigate a vessel is when empty, and this is certainly the desirable time and should be the aim, but the presence of cargo should not warrant the omission of fumigation for this reason alone. First, as the record shows, at least one-half of the rats can be reached in compartments other than holds. Second, referring to the record, showing results of fumigations in ballast and in cargo, rats were killed and subsequently found in encouraging numbers, notwithstanding the presence of cargo.

Nationality of vessels fumigated: Without selection, and considering the vessels in a routine way, the average number of rats to the vessel, according to nationality, would indicate that as a rule American cargo carriers, calling at San Francisco, contain on an average the fewest number of rats per vessel, as compared with Army and Navy transports, and Japanese and British steamships; that Japanese steamships contain the largest number; and British steamships next, the record being as follows:

American steamships, average rats per vessel.....	3 $\frac{6}{10}$
Japanese steamships, average rats per vessel.....	12 $\frac{1}{10}$
British steamships, average rats per vessel.....	8 $\frac{2}{10}$
United States Army and Navy transports, average rats per vessel.....	7 $\frac{5}{10}$

Species of rats found: Of the total rats fumigated, namely, 3,079, 1,925 were *Mus alexandrinus*, and 1,154 were *Mus rattus*. These

species therefore exist in approximately the same numbers, the *alexandrinus* being slightly more abundant. The absence of the Norway rat again indicates that this species is rarely ship borne.

Sailing vessels: Out of 60 sailing ships fumigated, only 2 were in cargo; 58 in ballast, showed a total of 261 in holds and 74 outside of holds, or practically one-fourth outside of holds, as compared with one-half in the case of steamships. It is believed that this is due to the fact that sailing vessels, as a rule, are smaller in size and lack the extensive superstructures which provide rat harborage; i. e., the superstructure space for rat harborage in sailing vessels is less than in steamships in proportion to their cargo-carrying capacity.

Vessels with rats vs. vessels without rats: From this tabulation it is shown that of 277 American vessels fumigated, 141 were without rats; of 59 Japanese vessels fumigated, 17 were without rats; of 40 British vessels fumigated, 16 were without rats. For practical purposes, it may therefore be stated that one-half of all American vessels entering this port, and one-third of all British and Japanese vessels fumigated were without rats. This is due, it is believed, to modern construction, sanitary education, and periodic fumigation.

San Pedro (Calif.) quarantine.—Acting Asst. Surg. G. T. Van Voorhees in charge.

San Pedro is the port of entry for Los Angeles. Shipping at this port has kept pace with the tremendous growth of that city, and there is every prospect for a continued increase.

On September 1, 1920, this station was made an independent station. The force consists of the medical officer in charge, one clerk and one attendant.

The functions of this station include quarantine inspection of shipping, inspection of aliens for the Immigration Service, examination of masters, mates and pilots, the fumigation of ships and medical relief for merchant seamen.

During the year 606 merchant vessels were inspected, 19,981 crew and 2,779 passengers. Thirteen naval vessels were boarded and granted pratique on the certificate of medical officers in charge.

The U. S. S. *Mississippi* from the Canal Zone, which had 25 cases of smallpox, removed to Ancon Hospital, Canal Zone, was held in port for final diagnosis of a suspicious case, which proved to be chickenpox. In the diagnosis the service representative was assisted by local health officers. No further cases developed on board, and the vessel was fumigated and repainted by the crew.

The American steamer *Ohioan* entered port during the year with a case of smallpox on board. The patient, a Chinese steward, had been quarantined by the captain. On arrival the patient was kept in isolation, and the entire crew was vaccinated and kept in quarantine while the vessel was in port. The ship was remanded to San Francisco for fumigation and final inspection.

Twenty vessels were fumigated for the destruction of rats and vermin, the work being done by the station force. Sulphur was the fumigant used, as there are no facilities for the use of hydrocyanide. This is the cause of considerable dissatisfaction among shippers, as the sulphur fumigation is disagreeable and not entirely effective. Sixty-seven vessels were remanded during the year to San Francisco

for fumigation because of lack of facilities for housing the crews. A suitable quarantine station is needed at this port.

The barge *Disinfector*, belonging to the service, has been thoroughly overhauled, the decks dressed and the vessel painted, and it is now in excellent condition, the painting having been done by the station force.

Five hundred and eighty-four out-patients were treated at the medical relief station, and in addition 151 patients were given treatment in a contract hospital in San Pedro.

Plans are in progress by the city of Los Angeles for the erection of an immigration station for the examination of aliens by service representatives.

Savannah (Ga.) quarantine.—Acting Asst. Surg. Barton Brown in charge.

The number of vessels inspected (268) is an increase of approximately 16 per cent over the previous year, and the number fumigated (64) is 73 per cent in excess of the number in report of last fiscal year. On March 25, 1921, the new 60-foot launch *H. D. Geddings*, equipped with four cylinder 65 horsepower Frisco standard engine, was received, and has greatly facilitated the boarding work by making it possible to board vessels without delay despite heavy seas or high winds, which frequently prevail in this exposed situation.

One hundred and seventy-six Gosso triple beds have been received and are being installed. Prior to February 19, 1921, all fumigation was done with sulphur, but since that date the cyanide method has been employed in many cases, and with the aerotruss ventilators are able to greatly reduce the time that a vessel must remain at the dock.

The southeast corner of the inclosed ground is now drained by an 18-inch ditch 300 feet long. Minor repairs have been made on several of the buildings, all the metal roofs (9) have been painted, medical officer's quarters painted inside and outside, pharmacist's quarters painted on west side inside and outside, and the attendants' kitchen painted inside and outside.

Repaired wharf and removed all rotten planking, and painted fence, colored attendants' quarters, gas and oil house, fumigating house, boathouse on old wharf, and tool house and engine hoisting house on old wharf were all painted with cold-water paint. Fire-hose boxes were repaired and given coat of cold-water paint.

Over 80 trees, including 5 fig, 6 peach, 6 pecans, and 5 mulberries, were planted. Also put out 6 grape vines and built arbor for same.

Tampa Bay quarantine.—Acting Asst. Surg. M. D. Hollis in charge. Post-office address, Fort de Soto, Fla.; telegraphic address, Fort Dade, Fla.

This station is ideally located for quarantine purposes, being at the southern entrance of Tampa Bay on Mullet Key, a small island to the inner and opposite side of Egmont Key. On the latter is located the Army post of Fort Dade, the Egmont lighthouse, and pilot station. There is ample room off the quarantine station for vessels, with a safe anchorage, the water alongside the wharf having a depth of approximately 20 feet. The station is 34 miles from the city of

Tampa and 28 miles from Port Tampa. Mail, subsistence, and operating supplies for the station have, up to this time, been transported from Tampa by the quartermaster's boat supplying Fort Dade, and heretofore this service has always been satisfactory, the cooperation extended by the Army officials being most cordial and accommodating; but the post is being rapidly reduced in personnel and transportation facilities, and it seems probable that this station will, later on, be in need of a boat with sufficient capacity for the transportation of supplies to the station from Tampa.

During the year there were inspected at the station 464 vessels, with a total personnel of 11,077. Eighty-two vessels were fumigated, and nothing unusual of a quarantine nature occurred. One case suspected of being plague was remanded to the station from Boca Grande. This was eventually diagnosed as a case of mumps.

The roofs, tanks, and buildings of the station are now being painted. The wharf is in good condition; the other buildings only fairly so; but the equipment is inadequate.

Terlingua (Tex.) quarantine.—Acting Asst. Surg. R. A. Wilson in charge.

The station has supervision over the traffic entering the United States at the ports of Santa Helena and La Jitis. During the year 3,327 travelers were inspected, of which number 810 were vaccinated. A mounted quarantine guard is continuously on duty along the river front in order to prevent, as far as possible, clandestine crossing; and in addition to the enforcement of quarantine laws and regulations he also cooperates with the Immigration Service. Nothing unusual of a quarantine nature has occurred through the year, although the prevalence of smallpox in the Mexican area across the river has constituted a decided menace.

Vineyard Haven (Mass.) quarantine.—Surgeon H. S. Mathewson in charge.

This station is in charge of the medical officer in charge of the United States Marine Hospital No. 22, H. S. Mathewson, who attends to the general administration of quarantine affairs other than the inspection of incoming vessels or supervision of fumigation. The professional duties are discharged by attending specialist Edward P. Worth, who is notified by the medical officer whenever his services are required.

The vessels anchor about a mile from the landing, and Dr. Worth has to provide a boarding boat at his own expense, as there is no boarding launch supplied this station.

During the year there were inspected 8 vessels, with a total personnel of 58. No quarantinable diseases were noted throughout the year.

Transactions at foreign and insular stations for the fiscal year ended June 30, 1921.

Stations.	Total number of vessels inspected.	Number of vessels fumigated.	Total number of passengers and crews inspected.
Aguadilla, P. R.	9		151
Amoy, China	47		
Antwerp, Belgium			24,292
Arecibo, P. R.	11		504
Arroyo, P. R.	1		8
Athens, Greece	66		19,642
Barcelona, Spain	131		
Callao, Peru	299	67	53,121
Cavite, P. I.	34	2	3,818
Cebu, P. I.	56		2,846
Cherbourg, France	103		38,231
Christiania, Norway	8		
Christiansted, Virgin Islands	13		94
Constantinople, Turkey			
Copenhagen, Denmark	33		7,563
Danzig, Europe	66		50,865
Fajardo, P. R.	73		416
Frederiksted, Virgin Islands	30		2,923
Guanica, P. R.	110		3,454
Guayaquil, Ecuador	167	140	14,884
Goteborg, Sweden	44		6,388
Habana, Cuba	2,831	27	224,177
Hamburg, Germany ¹	17		14,867
Havre, France	165		68,918
Hilo, Hawaii	42	17	2,248
Hongkong, China	588		
Honolulu, Hawaii	622	51	166,543
Humacao, P. R.	21		294
Iloilo, P. I.	63	249	4,237
Jobos (Aguirre), P. R.	7		415
Jolo, P. I.	55	2	4,246
Kahului, Hawaii	11	1	416
Koloa, Hawaii	5		66
Lahaina, Hawaii	2		77
Libau, Russia			
Liverpool, England	91		10,251
London, England ²			7,141
Mahukona, Hawaii	3		55
Manila, P. I.	833	158	131,741
Mayaguez, P. R.	135	2	5,780
Messina, Italy	60		3,181
Naples, Italy	272	25	159,352
Olongapo, P. I.	3	1	276
Palermo, Italy	65		23,507
Ponce, P. R.	147	13	6,549
Port Lobos, Mexico ³	541		
Progreso, Mexico	291	120	24,185
Puerto Mexico, Mexico	37	23	
Rotterdam, Holland	484	10	34,919
St. Thomas, Virgin Islands	562	12	29,187
San Juan, P. R.	374	230	35,705
Shanghai, China	403	37	83,397
Tampico, Mexico	179		
Trieste, Europe	22	16	2,810
Tuxpam, Mexico	118		
Vera Cruz, Mexico	273	266	3,160
Zamboanga, P. I.	24	1	3,194
Total	10,647	1,470	1,280,094

¹ Includes Bremen, Germany.

² Includes Southampton, England.

³ Includes Mata Redondo, Mexico.

FOREIGN AND INSULAR QUARANTINE.

CALLAO, PERU.

Acting Asst. Surg. J. L. Castro-Gutierrez in charge.

During the fiscal year ended June 30, 1921, 299 vessels were dispatched from this port for ports of the United States, its possessions

or dependencies. Of this number 232 were inspected and passed and 67 were fumigated prior to departure. There were 36,120 members of the crew examined, 11,826 cabin passengers, and 5,175 steerage passengers; and 3,398 persons were vaccinated prior to departure.

During the year plague infection has increased, there having been reported 758 cases of plague, with a mortality of about 33 per cent, in the various Provinces. Compared to previous years, the sanitary situation in Callao is less favorable, 61 cases of plague being reported during the year, the largest number since it first made its appearance in Peru in 1903.

Yellow fever appeared in the Department of Lambayeque in the early part of 1921, and up to the 15th of June 320 cases, with 126 deaths, were reported. In April the infection appeared in the State of Libertad, from which there were reported 28 cases and 13 deaths, but it is probable that the majority of cases were not reported. The above figures represent a small percentage of yellow-fever incidence. The infection in Lambayeque was apparently an extension from Piura, although the report from the Peruvian sanitary authorities indicated, for several months previously, that no case of yellow fever had occurred. The sudden appearance of the infection in Lambayeque is rather suggestive of the nonreporting of cases in adjacent territories. From the various localities in Peru there were reported through the year 455 cases, with a mortality of about 25 per cent. With respect to Lambayeque and Libertad, the infection was confined to interior ports and has not appeared on the seaboard. As a matter of fact, however, there are practically no harbors in these two Provinces. Mr. W. D. Wrightson, formerly with the United States Public Health Service, has recently been appointed as director of public health of the Peruvian Government, and much antimosquito work is being carried on in northern Peru under the direction of Dr. Hanson.

GUAYAQUIL, ECUADOR.

Acting Asst. Surg. Carlos V. Coello reports as follows:

During the fiscal year just closed (1921) 167 bills of health were issued corresponding to 140 vessels fumigated (holds and crew quarters only, for the destruction of rats), 14 inspected and passed, and 13 passed without inspection or fumigation. The number of inspections made were: Members of crews 10,752, of cabin passengers 2,751, and of steerage passengers 1,381. The number of first and second cabin passengers for the United States or the Canal Zone were 1,677, and 858 in the steerage. Certificates of cargo issued, 30.

Quarantinable diseases.—The following quarantinable diseases prevailed at this port and vicinity: Plague and smallpox.

Plague.—During the year 376 human cases with 126 deaths were reported, all of them, except one in Eloy Alfaro, were in Guayaquil. These figures, compared with those of the previous year, show an increase of 325 cases with a percentage of mortality of 33.5 per cent.

Rat plague has been prevalent throughout the year, the presence of the causative germ having been found in a high percentage of cases in which post-mortem examination was performed.

Vaccination, deratization, and fumigation were carried out extensively and actively through the year, in spite of which the epi-

demic had the usual periods of recrudescence and retrogression as in former years, that seem to be independent of the transitory measures in practice.

The highest occurrence of the disease in men occurred from October, 1920, to May, 1921—that is, during the rainy season. Before October and after May, the disease practically disappeared; and in general, both human and rat plague, as has just been mentioned, had a marked tendency to decrease in certain periods of the year and to increase in others, several opinions having been advanced to explain the phenomenon of these periodical fluctuations.

The local public health service is doing an active work at present in combating the disease, all the elements formerly employed against yellow fever having been applied to the antiplague campaign. At its offices, in the houses and neighborhood of actual or suspicious cases an average of 100 individuals are treated daily with Haffkine vaccine, which is supposed to produce immunity for six months at least. The number of rats trapped each day has been about 250; lately this number according to official information increased to 400. As soon as a human case is reported, it is at once sent to the isolation hospital in the suburbs of the city; the house is disinfected with creoline, and if it has double walls it is changed to afford the least possible cover for rats and mice; the clothes of the patient are, when possible, sent to the sterilizer of the service, etc.

The immunizing vaccine used at present is prepared in the local laboratory of the Public Health Service, the curative serum being imported from Lima (Peru) where it is made after the technique of the Pasteur Institute.

In general terms, in spite of the paucity of the means used to fight the epidemic, it may be stated that plague in Ecuador has some tendency to decrease since its appearance in 1908, when it caused 350 deaths in five months; as seen in the following quoted data corresponding to the last 10 years (official) :

In 1911 (calendar year) 513 cases were reported.

In 1912 (calendar year) 483 cases were reported.

In 1913 (calendar year) 727 cases were reported.

In 1914 (calendar year) 409 cases were reported.

In 1915 (calendar year) 327 cases were reported.

In 1916 (calendar year) 843 cases were reported.

In 1917 (calendar year) 372 cases were reported.

In 1918 (calendar year) 279 cases were reported.

In 1919 (calendar year) 66 cases were reported.

In 1920 (calendar year) 187 cases were reported.

The rat population, an estimation of which has not been made, but probably is, at least, equal to the human, does not seem to be affected by the constant trapping, as apparently they reproduce in the same proportion in which they are killed. Several hundreds of them may be seen at a time on certain parts of the river bank during the low tide.

The disposal of garbage consists of depositing it on the ground in the outskirts of the city, where it is supposed to be burned, and where the rats from the surroundings feed upon it and return to the lodging places in the houses. Lately some improvement has been introduced by forbidding the keeping of the food residue in the

houses during the night. This service formerly performed by the city has been lately taken over by the Direcccion de Sanidad Publica with better results.

The partial and imperfect system of sewerage with its outlets in the river bank a few yards from the edge of the Malecon (the front street), is another potential source of permanent infection and a propitious breeding place for rats. The sewers are without water during the dry season, and when the strong rains of the wet season flush them, the rat inhabitants are driven out, many of which find a refuge in the houses.

The new constructions are practically rat-proof, but old ones, constituting at least 75 per cent, look as if they had been designed to lodge rat inhabitants between the walls, floors, and ceiling. A newly established industry in Ecuador, the preparation of cement, is going to have a substantial influence in the change of construction, but it will not be possible to put this product on the market before another year.

Guayaquil, to get rid of the plague, needs a complete change in the system of building construction, including the demolition of the old houses, now actual harbors of rats and mice; the immediate completion of the waterworks supply, drainage and sewerage, and an appropriate system of refuse disposal.

At present, it is impossible for the Ecuadorian Government to undertake the enormous task that this work means, hence, the only thing that can be done is to continue as they are working now, intensifying a little the campaign along the present lines.

Smallpox.—One hundred and sixty-six cases, with three deaths, have been reported during the year. The epidemic, as on other occasions, has been characterized by its mildness to the point that it has been doubted if it is real variola vera, but the typical appearance of most of the cases seems to do away with the suspicion.

Vaccination is at present extensively used, and is compulsory, domestic vaccine being used, which has proved to be efficient. Isolation of all cases is practiced, and as soon as a case is reported, it is transferred to the isolation hospital.

All passengers for the United States ports or the Canal Zone are required to be vaccinated before they can purchase their tickets, unless they can show evidence of recent successful vaccination.

OTHER DISEASES.

Yellow fever.—According to repeated official declarations the last case of this disease occurred in May, 1919, since when it has not been reported.

A very few suspicious cases have occurred in which the clinical picture and course of the disease were quite suggestive, but the bacteriological examinations and the post-mortem findings of the fatal ones failed to confirm this diagnosis. The probabilities are that there were cases of ictero-hemorrhagic fever or hemoglobinuric fever.

Fumigation of ships.—Fumigation of holds and crew quarters with sulphur dioxide, for the purpose of the destruction of rats, has been practiced all through the year in vessels bound to the United States or the Canal Zone ports. Fumigation of saloons, cabins, etc., for the destruction of mosquitoes has not been performed since the disap-

pearance of yellow fever. In these premises this station, following the instruction from the bureau, conforms itself to the desires of the Canal Zone authorities.

HABANA, CUBA.

Acting Asst. Surg. Richard Wilson reports as follows:

THE WORK IN BRIEF.

The work of this office in brief is as follows: (1) To issue bills of health in connection with the consul general to all vessels going to the United States and its dependencies, either direct or via foreign ports, said bills of health to be delivered at the last moment, after all the requisites have been complied with; (2) to make a weekly report of the transactions of this office; (3) to report the sanitary condition of the city and port, and if possible of the surrounding country; (4) to fumigate vessels when necessary; (5) to inspect vessels, crews, and passengers when necessary; (6) to examine American seamen that are sick enough to be sent to a hospital, or to be discharged, and to report to the consul general recommending, according to the finding, what action to take.

SUMMARY OF TRANSACTIONS.

A summary of the principal transactions has been prepared in Table No. 2.

Referring to this we see that bills of health were issued to 2,831 vessels bound for the United States and its dependencies. This includes those going direct and those going via foreign ports. This is an increase of 422 over last year.

TABLE NO. 2.—*Comparison of the work of the last five years.*

	1916-17.	1917-18.	1918-19.	1919-20.	1920-21.
VESSELS.					
Vessels going direct.....	1,648	1,609	1,528	1,842	2,222
Vessels going via foreign ports.....	496	677	545	567	609
Total bills of health issued.....	2,144	2,286	2,073	2,409	2,831
Total members of crews.....	107,359	99,593	90,218	116,071	143,800
Total passengers.....	58,031	34,283	32,986	62,461	80,377
Passengers for the United States and its dependencies (included above).....	55,074	31,263	28,521	57,838	54,055
FUMIGATIONS.					
Vessels fumigated by the service.....	519	593	315	22	27
Vessels fumigated by the Cuban authorities under service supervision.....	243	150	105	188	219
Vessels recommended for fumigation at a United States port.....	74	30	4		
SICK SEAMEN.					
Sent to hospital.....	24	16	76	106	51
Treated in office or on board.....	61	98	148	602	163
Total sick seamen.....	85	114	224	708	214
Total visits.....	106	146	277	818	221
Certificates issued.....				210	136

FUMIGATIONS.

The fumigation of vessels is divided in three classes. First, "Vessels fumigated by the service." This includes vessels going direct to the United States or its dependencies, fumigated to comply with the quarantine regulations of the service. Second, "Vessels fumigated by the Cuban authorities under the supervision of the service." These are vessels that require fumigation by the Cuban quarantine regulations, and intend to go later to the United States, usually via Cuban ports. At the request of the ship's agents the service fumigator goes on board to inspect the fumigation, and if it is done in compliance with the regulations; he reports so, and a certificate is issued. Third, "Vessels recommended for fumigation at a United States port," either at arrival, or when empty, according to circumstances. These are vessels in transit with more or less cargo or passengers on board, on which account fumigation here is inadvisable.

As the conditions for which fumigation was required have disappeared the fumigations have decreased steadily. This year there were 27 in the first class, 219 in the second, and none in the third.

SICK SEAMEN.

At the end of the last fiscal year the writer was overworked, caused in part by the great number of sick seamen that applied for relief. This became so serious that the bureau was requested to send help. The bureau could not do so, but gave a conditional consent to reduce the work; so, after consulting with the consul general, and with his consent, the writer cut down this work to a minimum—that is, to examine only those sick enough to go to a hospital, or those that wanted to be discharged on account of sickness or injury. For these two classes the consul general would accept only the certificates of the writer. All other sick seamen had to go to a private physician at their own expense, or the vessel's, according to circumstances.

TABLE NO. 3.—*Sick seamen attended during the last five years.*

	1916-17	1917-18	1918-19	1919-20	1920-21
Sent to a hospital at Habana.....	24	18	79	106	51
Treated in office or on board.....	61	99	144	602	163
Total sick seamen.....	85	117	223	708	214
Total visits.....	106	146	277	818	221
Certificates issued (not counted until 1919-20).....				210	136

TRANSMISSIBLE DISEASES IN HABANA.

On Table No. 4 will be found the principal transmissible diseases reported during the fiscal year in Habana.

TABLE NO. 4.—*Principal infectious diseases reported in Habana during the fiscal year 1920-21.*

The deaths are included in the cases—	July-December, 1920.		January-June, 1921.		Total, fiscal year 1920-21.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1. Typhoid fever.....	466	93	195	44	661	137
1. Paratyphoid fever.....	5	1	4	0	9	1
2. Typhus exanthematicus.....	0	0	0	0	0	0
4. Malaria.....	949	14	803	12	1,752	26
9. Diphtheria.....	36	11	29	11	65	22
9. Scarlet fever.....	28	4	57	6	85	10
6. Measles.....	233	17	150	3	383	20
19. Chickenpox.....	16	2	112	2	128	4
5. Smallpox.....	3	0	37	1	40	1
6a. Cerebrospinal meningitis.....	5	4	11	7	16	11
17. Leprosy.....	1	0	4	1	5	1
16. Yellow fever.....	0	0	5	0	5	0

OPERATIONS OF THE SERVICE IN HAWAII.

Surg. E. A. Sweet, chief quarantine officer, reports as follows:

Quarantine procedure in the Hawaiian Islands was carried out at Honolulu and the subports of Hilo, Mahukona, Koloa, Lahaina, and Kahului. Owing to the establishment of a direct line of steamers between San Francisco and Ahukini, on the island of Kauai, an acting assistant surgeon was nominated just previous to the close of the fiscal year for duty at that station, the subports now numbering six.

Smallpox and leprosy have been the only quarantinable diseases observed during the year. On February 1, 1921, the steamship *Nanking* arrived with two cases of illness which the ship's surgeon had diagnosed as smallpox. Owing to the stage of the disease, all nonimmunized steerage passengers and crew were removed to quarantine for the usual period of observation, the cabin passengers undergoing vaccination without detention. The steerage and hospital were disinfected. Both of the cases were of the mildly confluent type, ending in recovery, but with scarring.

On April 30, 1921, the same steamship, the *Nanking*, reported a third case of smallpox among passengers in transit. The usual procedure, namely, the disinfection of quarters with 5 per cent trikresol by means of a spray pump and the examination and vaccination of all unprotected contacts, was followed.

The British S. S. *Nile* arrived from San Francisco on June 3, 1921, with an unvaccinated infant in the second cabin dangerously ill from an eruptive disease. The case was diagnosed as smallpox complicated by meningitis, death ensuing within 24 hours after removal to quarantine. As all of the passengers were destined for oriental ports, they were vaccinated and permitted to proceed, thus serving their period of detention en route.

A somewhat puzzling case occurred on the steamship *Tenyo Maru*, arriving May 16, 1921. The patient was an unvaccinated child presenting an eruption more or less indicative of chickenpox. The temperature curve, however, was strongly suggestive of variola, the usual secondary rise being present. The case was handled as smallpox and the customary precautions exercised, this being feasible

without delay to the vessel. Subsequently the child presented a successful vaccination take, thus establishing the diagnosis of chickenpox. It seems probable that the marked rise of temperature in this instance, quite typical of smallpox and occurring with the development of the rash, was due to an intercurrent infection.

Owing to the undue prevalence of variola in the Pacific Coast States during the winter months, an order was issued on February 23 discontinuing the boarding of shipping arriving after the sunset hour. Following improvement in the situation, namely, on April 18, this order was rescinded and mail or passenger vessels, as heretofore, were boarded up until 9 p. m.

A total of seven cases of leprosy occurring on five vessels was observed during the year. Five of these patients were traveling under prescribed regulations, having been returned to the Territory of Hawaii for isolation and treatment, while one, traveling on the steamship *Shinyo Maru*, was diagnosed by the ship's surgeon, the remaining case being detected by the boarding officer during the course of his inspection.

COMMUNICABLE DISEASES ON ARRIVING VESSELS.

An appreciable diminution in the number of cases of certain communicable diseases on vessels arriving at quarantine was observed during the year. This is explained by the slight decrease in the number of passengers carried, but was also due in part to a normal incidence of influenza and pneumonia, a condition which did not obtain in the previous year. The communicable diseases were as follows: Influenza, 62, compared with 261 for the previous year; tuberculosis, 141; pneumonia, unclassified, 38, only one-half the incidence of the 12 months preceding; mumps, 106; malaria, 60; gonorrhea, 49; measles, 24; chancre, 9; chickenpox, 8; dysentery, 9; meningitis, 10; syphilis, 24. Twenty-five cases of beriberi were observed. There were 139 vessels, 22 per cent of those arriving, upon which communicable diseases were reported or detected.

Practically all the cases of mumps were among Filipino steerage passengers on vessels arriving from Manila and Hongkong. Opportunities for contact en route and while awaiting sailing, together with the change from a warm to a colder climate, explain the occurrence of the disease among these people. The majority of the cases of malaria reported occurred on a single vessel, the steamship *Allo-way*, from Semarang, Java. The captain stated that following a several days' stay in that port practically every member of his crew had become ill.

On January 19 the Russian steamship *Penza*, sailing from Hongkong and Macao with 715 Chinese coolies destined for Habana, arrived at quarantine. She gave a history of six deaths en route, one further fatality occurring the morning after arrival. Investigation, including a post-mortem examination, showed that the deaths resulted from pneumonia and scurvy. The sanitary conditions on board this vessel were, however, deplorable, marked congestion and overcrowding existing. Eight hundred and thirty-two persons were stowed away on a ship whose net tonnage was but 1,333. That a greater number of fatalities had not occurred was indeed surprising. The

Penza was refused clearance at Hongkong owing to noncompliance with the English laws, and she had been forced to embark her passengers at Macao. At Honolulu the vessel was granted provisional pratique for a sufficient time to water and coal, and during the remainder of her stay she was kept in the open harbor with only limited communication with shore.

A total of 52 deaths was reported on arriving vessels, pneumonia being the etiological factor in 13 of these cases. Attention is invited to the fact that in two instances patients who were delirious from disease jumped overboard and were drowned. The constant presence of an attendant should be insisted upon in all cases of serious illness.

DISINFECTION OF VESSELS.

At the various Hawaiian ports 74 vessels were disinfected or fumigated during the year, 56 being treated at Honolulu, 17 at Hilo, and 1 at Kahului. Forty-seven of the fumigations were for rat destruction, 18 for mosquitoes, and 4 for vermin, the latter being done at the request of the owners. There were 5 disinfections for quarantinable diseases. Orders were issued during the latter part of the year substituting cyanide for sulphur fumigation, and, unless there are specific contraindications, cyanide is now the fumigant of choice, the majority of fumigations being performed at the quarantine wharf. An electric motor and fan have been installed, thus considerably facilitating the airing out process and lessening delay. Inasmuch as a rather large percentage of the vessels treated at Hawaiian ports is for mosquito destruction, the work being done outside the harbor with the crew remaining aboard, it is not possible to adopt cyanide fumigation for all classes of shipping, neither is it feasible at this time to follow this method at subports.

Daily inspection of vessels alongside of wharves, to determine compliance with rat-guard and other regulations, has been continued as heretofore. Only rarely has it been necessary to call the attention of captains to derelictions of this nature.

ASSISTANCE RENDERED OTHER ORGANIZATIONS.

Of the 31 persons cared for at quarantine, 4 were merchant seamen suffering from contagious diseases. At the request of the Territorial board of health the bodies of 5 persons dead from leprosy were cremated and there were 4 additional cremations for other causes. The station has continued to supply the Territorial board of health with certain culture media, that organization furnishing the necessary material for its preparation. From time to time, as requested, laboratory animals have been forwarded to Kula Sanitarium and to physicians engaged in research work.

PLAGUE PRECAUTIONARY MEASURES.

The cooperative arrangement whereby the Territorial board of health and the service have carried on certain antiplague measures in Honolulu was continued, rodents either captured or killed having been examined in the service laboratory. A total of 15,696 rodents

were so examined, all proving negative for plague infection. Of these, 3,613 were *Mus alexandrinus*, 2,747 *Mus rattus*, 3,028 *Mus norvegicus*, and 6,203 *Mus musculus*, mongoose making up the remainder.

It should be stated that the plague precautionary measures in Honolulu afford information concerning infection in the rat population, and do not effect any considerable reduction numerically among rodents. The opportunities for rat harborage, both in the business and residential sections of the city, continue to be excellent, and until well-recognized permanent measures are instituted the dangers from plague will persist. Honolulu for a number of years has been free from infection of this nature, this in part being due to the vigilance of the quarantine service at foreign and domestic ports; that such freedom will continue indefinitely is to be questioned. While hesitancy on the part of the municipality in inaugurating at this time measures of prevention calling for an outlay of considerable sums of money can be understood, it is believed that certain precautions entailing only slight expenditure should be instituted. Among these is the permanent rat proofing of all new construction in the business section of the city. If this could be brought about, either by municipal ordinance or otherwise, it would add materially to the safety of the community.

So far as plague in the Hamakua district of the island of Hawaii is concerned, a subsidence of the infection, as determined by bacteriological examination and human cases observed, has been noted. It was not until May 6, 1921, that the first rat plague case was discovered, this also being the only case on record during the 12 months' period. However, shortly thereafter, namely, on May 14, a human case developed, followed by a second on May 21, these cases proving fatal. One of the patients was an employee of the Homokea Mill Co. and the other of the Paauhau Mill Co.; in both the infection was of the cervical type.

The Territorial board of health reports a total of 147,968 rodents destroyed during the year. Of this number 29 rats were found dead, one being the positive case noted above, 20,349 were killed on various plantations during the burning of sugar cane, and 127,590 were trapped or shot. Of the rodents classified, 894 were mongoose, 16,190 were *Mus alexandrinus*, 16,466 *Mus norvegicus*, 22,119 *Mus rattus*, and 71,945 *Mus musculus*. Of the rodents captured, 127,620 were examined macroscopically. In addition to this work more than 300,000 pieces of poisoned food were distributed monthly.

OPERATIONS OF THE SERVICE IN THE PHILIPPINES.

Passed Asst. Surg. C. J. McDevitt, chief quarantine officer, reports as follows:

ACTIVITIES IN THE PHILIPPINES.

The United States Public Health Service carried on a number of duties in operating the bureau of quarantine service in the Philippine Islands and caring for its beneficiaries. The service rendered may be divided as follows: (1) National incoming quarantine; (2) consular quarantine; (3) interisland quarantine and supervision of interisland vessels; (4) dispensary treatment of American seamen; (5) hospital treatment of seamen; (6) sanitary supervision of vessels

in port; (7) sanitary condition of ports and contiguous shore; (8) immigration inspection; (9) miscellaneous functions not included in the divisions just cited and aid to other bureaus of the Government.

OPERATION AND EQUIPMENT.

Quarantine boarding work is done at all ports of entry immediately upon the arrival of the vessel at the quarantine anchorage. There is no longer a requirement for vessels to proceed first to a quarantine station. Inspection stations are maintained at Manila, Cebu, Cavite, Iloilo, Jolo, Olongapo, and Zamboanga.

Two quarantine stations are maintained, equipped for the treatment and detention of the personnel from vessels. The station at Mariveles is for vessels arriving in the northern section of the islands, and the one at Cebu for the southern islands.

PERSONNEL.

The quarantine service in the Philippine Islands was in charge of Passed Asst. Surg. L. R. Thompson from July 1 to October 15, 1920, and since October 15, C. J. McDevitt, surgeon (reserve), has been quarantine officer of the port of Manila, and chief quarantine officer for the Philippine Islands, having under his direction the bureau of quarantine service for the Philippine Islands. There are assigned to duty in the Philippines 4 commissioned officers and 1 pharmacist. During the year 3 commissioned officers were relieved from duty in the islands and 3 other officers were detailed to take the places of those relieved. At the close of the fiscal year there remained 4 commissioned officers, 2 acting assistant surgeons who had been appointed for duty in the Philippines in the quarantine work, and 1 pharmacist. Attendants to the number of 65 are also employed.

OUTPATIENT DISPENSARY FOR AMERICAN SEAMEN.

During the year American seamen were treated in out-office or hospitalized only at the port of Manila. Work was done at Iloilo and Cebu the previous year but was discontinued because the order extending relief to American seamen in the Philippines specified Manila only. At the beginning of the year the out-patient office and dispensary was located in the customhouse but owing to lack of space to properly handle the work the office was moved to the Masonic Building, where a suitable and satisfactory suite of offices was obtained. Medical service was rendered to seamen by all the officers stationed in the Philippines. Equipment was lacking for some months but at the close of the year the office and druggist's section are adequate for the present. There were treated 622 out-patients and there were 769 treatments given, as shown by the usual tabulated reports. Cases were also given attention for the United States Employees Compensation Commission, both when employees applied at the office and when cases were referred by the commissioners in Washington.

HOSPITAL CARE OF AMERICAN SEAMEN.

American seamen were cared for only at Manila at St. Paul's Hospital and the regular officers took charge of the treatment. There

were 209 American seamen admitted and with the 19 in the hospital at the beginning of the year there were a total of 228 persons hospitalized. Discharges numbered 220 and there remained in the hospital June 30, 1921, 8 patients. There were no deaths of American seamen undergoing hospitalization during the year. There were furnished 4,652 days of hospital treatment.

There were 287 American vessels from foreign ports in the harbor of Manila, the personnel of which received more or less medical attention.

INCOMING QUARANTINE.

The incoming quarantine was conducted in about the same manner as in previous years. The hours of inspection have been maintained from sunrise to sunset. Daylight inspection is of paramount importance because of the proximity of infected foreign ports to the Philippines and the extra vigilance required in consequence. Consideration was given to night inspections but shipping interests and the local customs officials have not favored the idea on account of the additional expense which would be incurred in maintaining a night and day alternating shift of employees.

The incoming work has been tabulated as follows for the fiscal year ended June 30, 1921:

Stations.	Number of vessels inspected.	Number of vessels fumigated.	Total number of passengers and crews inspected.
Cavite.....	34	2	3,818
Cebu.....	56	80	2,846
Iloilo.....	63	249	4,237
Jolo.....	55	2	4,246
Manila.....	533	158	131,741
Olongapo.....	3	1	276
Zamboanga.....	24	1	3,194

AIRCRAFT AND QUARANTINE.

The new regulation which includes aircraft in the provisions of the quarantine laws and regulations was duly promulgated in the Philippines. There has been no occasion to carry out its provisions, but there have been suggestions of a mail route being established which would bring a line of aircraft from foreign ports. One difficulty which might be encountered is due to the fact that the landing places are quite remote from the shipping centers. There would be no particular difficulty in obtaining a bill of health for a departing machine, but an arriving plane, unannounced, would suffer considerable delay in arranging for quarantine inspection owing to the distance from the city of the aviation field. A seaplane of course could be more easily inspected.

RAT QUARANTINE.

Measures were carried out throughout the year for the reduction to the greatest possible extent of the rat population of vessels and the territory contiguous to the piers and water fronts at the various ports of entry in the Philippines.

The Philippine health service conducts on a small scale a systematic rat-catching campaign, having employees at work trapping and destroying rats in connection with the sanitation of the city and suppression of epidemic diseases. The rats caught are examined from time to time for plague with the result that not one plague rat was detected during the year under report.

The rats killed in the fumigation of vessels also proved negative for plague in those cases where sufficient suspicion existed to have the rats examined. Even during the slight flurry in the number of cases of plague in Hongkong no cases of rat plague were found among the rats killed by fumigations of the Hongkong-Manila vessels which were fumigated every trip during the time plague was epidemic.

The total number of vessels fumigated was 493.

	Manila.	Cebu.	Iloilo.
Number of rats	450	420	1,612
Number of mice	122	93	176

RAT PROOFING OF THE MANILA PIERS AND RIPRAP.

The question of the presence of rats upon and contiguous to the piers at Manila has been the subject of considerable comment in the past. It was the intention that the type of construction of the piers would make them rat proof, but it is questionable whether in practice they can be considered rat proof.

The chief quarantine officer considered it his duty to recommend to the Government of the Philippine Islands the taking of still further precautions in this direction. In a letter to the Governor General and the director of public works it was pointed out "that bubonic plague has been prevalent in many parts of the Orient, and has also appeared in certain cities of the United States, and epidemic centers of plague exist very close to Manila. It is almost preposterous to hope that plague can always be kept out of the Philippine Islands by the ordinary quarantine measures. Reference is made to the absolute necessity of rat proofing at the Manila water front, particularly that section contiguous to the piers. From a public health standpoint it is deemed imperative that the water front be protected as much as possible and made rat proof so that the danger of plague-infected rats gaining entrance to the islands and to the city be reduced to a minimum. The quarantine service realizes that such a measure would entail considerable expense, but the amount of money it would cost is very small, indeed, when compared with the hundreds of thousands which would have to be expended to eradicate plague once an epidemic has started. Recommendation is therefore again made that the riprap adjacent to Piers 1, 3, 5, and 7 be filled in so that there are no spaces between the stones to a point well below the low-water line to make it impossible for rats to live therein and that all piers be made absolutely rat proof."

FUMIGATION OF VESSELS.

Fumigation was carried out at all the several quarantine stations and ports of entry in the Philippines mainly as an antirat measure

to reduce to a minimum the principal medium for the transmission of plague. The Philippines being contiguous to centers which are plague foci, such as the China Coast, two to four days distant, and the groups of islands just south of the Philippine Archipelago, which are more or less constantly in communication with the plague-infected ports of India, all tend to make the problem of the introduction of plague a most vital one to the quarantine officer.

Vessels from Hongkong during the increase of plague at that port were fumigated upon arrival, and vessels on the Hongkong and Manila run were required to be fumigated every trip; when the epidemic died down the fumigation was performed every other trip and later once in four months. Vessels from Saigon and Pnom Penh were fumigated each time they arrived in the Philippines, if they had not been fumigated prior to sailing at the port of departure.

Interisland vessels were also fumigated once each six months. At the time of these fumigations a general inspection is made and insanitary conditions on board are called to the attention of the officers and instructions given for their correction. Much yet remains to be accomplished to make the interisland vessels models of sanitary excellence; but the efforts of the past years of endeavor have not been without very noticeable improvements both in cleanliness and in the type of installation of toilets, sanitary convenience, baths, water containers, and condition of linen and service.

In the tables of statistics of the several ports the number of vessels fumigated is noted in detail.

SMALLPOX IN THE PHILIPPINE ISLANDS.

While the Philippine Archipelago is one of the most outstanding examples of the efficiency of vaccination, yet once in a while cases of smallpox are reported. The extreme difficulty, if not impossibility, of vaccinating every person is one of the causes of the few cases that have occurred. They occurred among the children who escaped vaccination and in adults who either were not vaccinated or the vaccination did not "take," or were recent arrivals from abroad. Since the completion of the vaccination of the general population the deaths per year have been reduced from many thousands to a meager few. It is confidently expected that smallpox will never again be a serious factor in the health work, provided, of course, that compulsory vaccination is continued. The last case of smallpox in Manila occurred September 12, 1920.

The quarantine service in the Philippines vaccinated on arrival all steerage passengers from abroad, and thus much of the material which would be soil for the development of smallpox is made barren; and the actual results of this prophylactic measure can scarcely be measured, but it must be considered as one of our best accomplishments of the year.

During the past 12 months the quarantine officers at the port of Manila vaccinated 18,339 persons members of the crew or passengers of arriving vessels.

CHOLERA.

As was stated in previous annual reports cholera appears to be endemic in the Philippine Islands. During the fiscal year under re-

port it is pleasing to note that no serious outbreak of the disease occurred. Its presence, however, is always a menace. We are unable to tell just when it may assume added virulence and an epidemic occur.

While cholera is present even in remote parts of the islands it must be considered a menace from a quarantine standpoint both to the islands and to the States and measures must continuously be enforced to prevent its occurrence on vessels bound for the United States. Though there is not sufficient cholera present to require quarantining against the Philippine Islands the greatest care should be and is taken to prevent its being carried from the Philippines to other parts of the world.

LEPROSY.

The establishment and successful operation of the leper colony of the Government of the Philippine Islands at Culion, together with compulsory segregation, has resulted in a steady decline in the number of new cases of this disease reported each year. A number of vessels have brought lepers to the Philippines, but in all instances they have been Filipinos, citizens being returned to the islands for segregation at Culion. The emigration from the Philippines of large numbers of laborers to Hawaii, Alaska, and the Pacific coast of the United States has carried with it the probability of leprosy occurring among a number of Filipinos who are living outside of the archipelago. Such cases as occur are usually returned to the Philippines. It is customary for them to be carefully isolated on board and every precaution taken in connection with their transportation and segregation on board the steamer. The usual disinfection of the compartment occupied by the lepers is performed by the quarantine service.

Considerable publicity has resulted from the apparently successful cures of lepers, both at the San Lazaro Detention Hospital and at the Culion leper colony. The legislature appropriated \$50,000 to be used in this work during the present calendar year, and promises have been made for future amounts for the same purpose. A request was made for an appropriation of \$1,000,000 as a fund for this purpose, but, owing to the financial condition of the Philippine Government at this time, only sufficient funds for the present year were provided. About 50 lepers have been pronounced cured and released on parole up to this date. They are required to report periodically during a period of two years in order to ascertain if there be a recurrence of the active symptoms of the disease or whether at the termination of that period the bacillus could be found.

IMMIGRATION MEDICAL INSPECTION.

The immigrant medical examination in the Philippines is made by the quarantine officers in addition to their other duties. The examinations are made whenever the aliens are presented by the immigration officials, either on board the arriving vessel, or at the detention stations, or in the immigration office in the customhouse, or in the office of the quarantine service. Less actual medical work in this line was necessary this year than for some time past.

There has been a large number of arrivals of children of domiciled aliens who were requested be given a special examination to determine whether or not they were more or less than 21 years of age.

AID TO OTHER SERVICES.

The quarantine service during the past year was of considerable aid to the other bureaus and offices of the Federal and Philippine Governments; and has also furnished information to foreign consuls with regard to the shipment of cargo to their countries; and given data regarding health conditions at various ports.

Aid furnished may be briefly stated as follows: Bureau of customs: Physical examination of seamen, examination of candidates for marine licenses, examination of aliens, medical service to aliens when necessary, dispensary and first aid to employees, certification of probable age of domiciled aliens, and treatment of seamen referred by the insular collector acting as American consul at the various ports. (2) United States Shipping Board: Examination and certification of prospective employees, inspection of foodstuffs on board vessels as to quality or sanitary condition, examination of candidates for the officers' school of the board, dispensary and hospital treatment of seamen. (3) Bureau of education: Examination of the candidates for entrance to the Nautical School. (4) Bureau of health: Fumigation and disinfection of vessels carrying lepers to and from the leper colony, and furnishing launch transportation for field force. (5) Provincial government: Furnishing transportation for official business. (6) Bureau of agriculture: Disinfection of vessels which brought infected cattle. (7) Weather bureau: Displaying typhoon signals as an aid to vessels during the typhoon season. (8) Bureau of commerce and industry: Maintaining a light for the lighthouse division as an aid to navigation. (9) Food and drugs board: The authentication of all certificates covering meats or meat products imported into the Philippines.

PROPERTY.

The equipment of the quarantine stations has become an acute problem. The stations were well equipped and the property was adequate during many years. During the past four years the legislature would only allow the quarantine service the sum of \$750 per year for new equipment. One year the amount of property worn out and condemned amounted to over \$4,000, and later another condemnation of property worth \$2,000 took place. With the increase in prices not more than one-sixth of the property worn out could be replaced. This year the emergency board has decided that only one-half of the amount appropriated can be expended. Unless this condition is changed it will soon be impossible to operate the quarantine stations for the detention of persons on account of lack of equipment. All of the furniture in the offices, being now over 20 years old, is becoming useless from dry-rot and the ravages of wood-eating insects. The financial crisis through which the Philippine Government is passing affects the quarantine service very acutely.

CEBU.

At the port of Cebu, which is the principal port of the southern part of the Philippine Archipelago, the service maintains a detention and disinfection station on the island of Cauit, which is 4 miles from the usual quarantine anchorage in the Cebu Harbor. The arriving vessels are boarded at the anchorage of the port of Cebu, not at the quarantine station, as the latter procedure would in most instances considerably delay the vessels.

The station at Cebu is available for vessels arriving at any of the ports in the southern portion of the islands. The equipment is adequate for the treatment of vessels of any size; but the accommodations for the segregation and detention of personnel is limited, but so far has been adequate for all the demands which have actually been made upon the station.

Less disinfection and detention work was done this year than for many years. All of the usual quarantine functions were carried out. There were no vessels held for extended periods in quarantine this year. Vessels in the interisland trade were fumigated once each six months. All applicants for marine licenses were physically examined. Food products imported were passed. Cargo destined for the United States was inspected and certified before being loaded.

The figures for part of the work accomplished at Cebu are as follows:

Vessels inspected from United States ports-----	10
Vessels inspected from foreign ports-----	46
Vessels disinfected on account of disease-----	2
Vessels in quarantine-----	2
Vessels fumigated-----	80
Crew inspected on arriving vessels-----	2, 822
Cabin passengers inspected on arriving vessels-----	24
Steerage passengers inspected on arriving vessels-----	0
Persons detained in quarantine under observation-----	0
Persons vaccinated at quarantine-----	39
Seamen examined for licenses-----	11
Bills of health issued for vessels for foreign ports-----	59
Bills of health issued to vessels for United States-----	71
Interisland vessels inspected in port-----	102

BUILDING AND STRUCTURES AT CEBU.

During the year the district engineer administratively reconstructed the wharf at the Cebu quarantine station and furnished new piling and considerable new decking. The cost was paid from the fund for repairs of public building allotted to the quarantine service. Several of the small structures of the station also received minor repairs. The building used as a tool house and storeroom was torn down and rebuilt.

Plans were drawn and approved and considerable work was done on the construction of a concrete building for cabin passengers to cost \$12,500. The building is well under way and should be completed in a few months.

There are some needed repairs which will have to be made during the coming year, all of which will be asked for in the estimates for appropriations for public works. Having the budget system,

no overdrafts can be incurred. New tanks for water will have to be provided and minor repairs to the barracks made. An automatic electric light plant should be installed to reduce the danger from fire and increase the usefulness of the station.

ILOILO.

At the port of entry of Iloilo the Public Health Service maintains an inspection station only. There are no available disinfection facilities. The plants are on hand, but no building exists for their installation. A lot of ground was set aside on the river front, and when funds are available the intention is to build a disinfection building with a few baths and several rooms to be used to house temporarily cases of quarantinable diseases removed from vessels. The quarantine office is located in the new customhouse and boarding is done on the Straits in the majority of cases, at other times in the river. All vessels come up the river and berth alongside the new quays which have been completed.

Some of the quarantine statistics at Iloilo may be tabulated as follows:

Vessels inspected	63
Vessels disinfected and fumigated	249
Vessels in quarantine	2
Crew inspected	3,781
Passengers inspected, cabin	140
Passengers inspected, steerage	316
Bills of health issued	168
Persons vaccinated	144
Sanitary inspections interisland vessels	76
Seamen examined for licenses	11

MANILA.

At Manila arriving vessels are boarded in Manila Bay near the breakwater or inside the breakwater during bad weather. The general conditions as reported for the islands apply to Manila. The amount of quarantine work at this port compares favorably with the work done at the other large ports of the continental United States. Again it is noted that there has been an increase in the number of vessels arriving at Manila direct from foreign ports. Last year there were 776 vessels with a tonnage of 2,413,192. This year there were 833 vessels with a tonnage of 2,665,271, an increase of 57 vessels and 252,079 tons.

The following table exhibits some of the transactions at Manila:

Vessels inspected from United States ports	223
Vessels inspected from foreign ports	610
Vessels disinfected on account of diseases	4
Vessels disinfected and fumigated	158
Vessels given sanitary inspection in port	114
Crew inspected on arriving vessels	79,737
Cabin passengers inspected on arriving vessels	18,169
Steerage passengers inspected on arriving vessels	33,835
Personnel vaccinated at quarantine	18,339
Applicants for marine licenses examined	447
Stool examinations made for hookworm	379
Stool examinations made for cholera carriers	360
Bills of health issued for United States ports	377
Bills of health issued for foreign ports	585

Total number of vessels arriving at Manila quarantine with sickness on board:

Nature of sickness:

Quarantinable diseases, number of vessels.....	4
Communicable	25
General diseases other than above.....	8

MARIVELES QUARANTINE STATION.

At Mariveles, a small town on the Bay of Mariveles, is located one of the two quarantine disinfection and detention stations in the Philippines. Mariveles Bay is a small and very safe body of water in typhoons and with excellent anchorage and considerable depth of water. At the quarantine wharf there is 30 to 36 feet of water at the vessel's keel according to tide. This station serves for vessels arriving at Manila and other ports in the northern part of the islands. It is fairly well equipped and has a capacity of 100 cabin and 800 steerage passengers. The capacity was reduced by the old barracks becoming useless and unsafe. The steerage barracks are concrete structures of modern type. The cabin barracks is a two-story red-wood building with 56 rooms, waiting rooms, dining rooms, kitchen, and porch on three sides of the first floor. The administration buildings are stone with iron roofs, two of which are in excellent repair, but the third will require new floor, partitions, and roof timbers.

The amount of actual quarantine detention and disinfection work accomplished during this year at Mariveles was not great, but the station was kept in readiness and in a high state of efficiency at all times, for with epidemics of quarantinable diseases ever present in the Orient there is no telling just what moment the station will be required for use to its fullest capacity.

A few of the quarantine transactions have been tabulated as follows:

Vessels calling at the station for treatment.....	5
Vessels disinfected or fumigated.....	5
Persons bathed and effects disinfected.....	336
Pieces of baggage disinfected.....	2, 900
Persons vaccinated.....	304

MAINTENANCE OF BUILDINGS AND STRUCTURES AT MARIVELES.

The usual routine repairs were made to the buildings and structures, but on account of the lack of funds all the repairs required were not made, and some of the buildings in consequence are fast deteriorating beyond the resources and ability of being repaired by the station employees. In previous years there was usually about \$2,000 which could be expended for labor out of the regular appropriation, but owing to the increases of compensation there is no saving from salaries and wages, and the repairs which in former years were so regularly and satisfactorily made can not now be attempted. Due to the reasons stated it will be necessary to have the two bathhouses and the large detention building repaired by contract, and it is seen that the repairs required will mean practically reconstruction.

During the year the bureau of public works completed the repairs of the cabin passenger barracks. The foundation posts were renewed where necessary, siding and flooring removed and replaced, bathrooms rebuilt and installations made, and the building painted inside and outside. It is now in serviceable condition and should remain so for the next few years.

The new fender system for the concrete wharf was also completed, and it was hoped that it would be very satisfactory; but an accident which broke one of the clusters showed that the teredo has attacked the piles and practically ruined the entire system, the class of timber used being worthless for the purpose, probably because of improper creosoting of the piles. This will render absolutely necessary the replacement of the fender piles at an early date for the protection of the concrete pier, which can not be expected to withstand the impact of large vessels. An effort will be made at once to secure a new fender system.

A small refrigerating plant should be installed as soon as such have proven satisfactory. Its cost would not exceed the cost of foodstuffs which spoil when the ice runs out. With only one supply boat a week ice can not be secured in large enough quantities to keep from one week until the next.

OPERATIONS OF THE SERVICE IN PORTO RICO.

Surg. C. M. Fauntleroy, chief quarantine officer, in charge. Post-office and telegraphic address, San Juan, P. R.

The service maintains quarantine stations at San Juan, Ponce, Mayaguez, Aguadilla, Fajardo, Humacao, Arroyo, Arecibo, Guanica, and Central Aguirre.

The activities of the United States Public Health Service, under direction of the chief quarantine officer, in Porto Rico embrace the following:

1. National quarantine.
2. Antiplague measures.
3. Marine-hospital relief.
4. War Risk Insurance.
5. Medical inspection of aliens.
6. Miscellaneous.

NATIONAL QUARANTINE.

The most important activity of the service in Porto Rico is the conduct of the national quarantine. The chief quarantine officer is stationed at San Juan and he is responsible for the proper conduct of all quarantine matters at the subports of Porto Rico, the work at each of the subports being under the direct supervision of an acting assistant surgeon of the Public Health Service.

The only fully equipped quarantine station in Porto Rico is located on Miraflores Island, San Juan Bay. It contains facilities for the detention of personnel of vessels and includes hospital accommodations for the sick, and also apparatus for disinfection and fumigation. The administrative office is located in the old naval station at San Juan, where the service also maintains an out-patient office and laboratory facilities. The transactions for the year in Porto Rico are tabulated as follows:

	San Juan.	Subports.
Vessels inspected.....	374	395
Vessels fumigated.....	230	15
Bills of health issued.....	619	612
Crews inspected.....	15,336	10,032
Passengers inspected.....	20,369	3,934

One case of smallpox in the person of a seaman on board a vessel at Guanica, was the only quarantinable disease observed on vessels arriving at Porto Rican ports during the year, this case being promptly removed from the vessel which was immediately disinfected and all exposed persons vaccinated, including contact laborers ashore. The detailed reports of transactions at each of the sub-ports will be found elsewhere in this report.

PLAGUE IN PORTO RICO.

Bubonic plague was officially declared to be present in Porto Rico on February 21, 1921, by proclamation of the governor.

About one week prior to the official announcement of the presence of plague infection, the local newspapers reported the fact that a number of dead rats were being found in a wholesale provision store at No. 43 Tetuan Street, San Juan. It was afterwards ascertained that this occurrence was not reported to the local health authorities, and that the failure to bring this very significant matter to the attention of the proper authorities was due to the fear of inconvenience and expense which may result to the owner of the premises by his being compelled to submit to a thorough overhauling and repairs which very likely would have been ordered by the health authorities. It was also ascertained that these dead rats, 10 to 20 each day, were collected by the person employed on the premises and deposited in the garbage can along with other refuse matter, care being taken to conceal the rats beneath the other contents of the receptacle, and the can was afterwards emptied by the garbage-disposal crews and taken to the public garbage dump located at Puerta de Tierra which is now a part of San Juan, lying between the old city limits and Santurce. In consequence of the above described action taken to conceal the occurrence of this marked mortality among the rats in the Tetuan Street store, none of these dead rats were subjected to laboratory examinations, but the subsequent happenings were very soon to reveal the cause of the epizootic and to establish beyond question the fact that a very widespread plague infection among these rats existed and was the cause of the rat mortality. Within one week of the finding of the dead rats on the premises in Tetuan Street, the daughter of the proprietor of the store was stricken suddenly with a violent illness which was accompanied by enlarged femoral glands and a very suggestive train of clinical phenomena, but her illness was not determined to be plague, and she finally recovered. While this first case of sickness was being observed by local physicians, the father of the sick girl, and the proprietor of the store, was also taken suddenly very sick and he rapidly developed a typical clinical case of bubonic plague which was confirmed by laboratory examinations and later at the post-mortem examination, for this man paid the full penalty for his criminal negligence in not properly reporting the epizootic among the rats on his premises.

There occurred a total of four cases of human plague and two deaths among the persons who were employed in this store on Tetuan Street. It was stated that after the infected building was thoroughly fumigated by the local health authorities not a single rat was found dead, nor have any rats been seen on the premises since

the occurrence of the epizootic mentioned above, which seems to indicate that either all of the rats, which found harborage on these premises, were destroyed by plague infection or that those few remaining rats migrated to some other place. Another fatal case of human plague occurred in the person of a woman living in a house just opposite to the infected store in Tetuan Street, but in view of the fact that this woman made frequent visits to see the daughter of the proprietor of the store while she was sick, it is thought that this woman became infected by a flea while she was visiting the sick girl.

The total number of human cases of plague that have occurred in Porto Rico since the discovery of the original focus of infection in Tetuan Street, San Juan, up to and including June 30, 1921, are classified as follows according to the localities in which the cases were discovered: San Juan, 6; Caguas, 3; Santurce, 3; Bayamon, 1; Carolina, 4; Puerta de Tierra, 4; Dorado, 1; Isabela, 1; Manati, 2.

The total number of rats confirmed as plague infected since the beginning of the epidemic in February to June 30, 1921, are classified as follows, according to the communities from which reported: San Juan, 43; Puerta de Tierra, 11; Santurce, 22; Carolina, 1; Guaynabo, 1; Rio Piedras, 6; Bayamon, 1; Manati, 2.

The insular department of health assumed all responsibility for the plague suppressive measures throughout the island, under the supervision and direction of the commissioner of health for Porto Rico, and the Public Health Service assumed charge of all incoming and outgoing maritime quarantine procedure, including also the supervision and direction of all antiplague measures concerning the shipping and the methods of storing, handling, and treatment of cargo, and also the direction and control of all antiplague measures instituted along the entire water front at San Juan. The Public Health Service has at all times endeavored to cooperate with the insular department of health, and when requested to do so has offered a number of helpful suggestions with a view of expediting the work of eradicating the plague infection in Porto Rico. No friction of any description has occurred between the quarantine authorities and the authorities of the insular department of health at any time since the inception of the plague epidemic; on the contrary, a spirit of mutual helpfulness has been manifested by both public health agencies working side by side and seeking cooperation to the end that the plague infection may be speedily eradicated from Porto Rico.

Outgoing maritime quarantine.—Immediately following the announcement of the existence of plague in San Juan, the Public Health Service caused action to be taken with a view of preventing the possible spread of plague by means of vessels to other ports, and to this end every vessel lying at San Juan that would be likely to spread the infection to other places was fumigated throughout, and no vessel was allowed to remain alongside any pier or wharf unless every precaution was rigidly observed to prevent the access of rats to such vessels. The bureau directed that the fumigation of all vessels be instituted prior to loading at San Juan, when the vessels were bound for ports of the United States, the Canal Zone, or the insular possessions of the United States, and also to certify bills of health as to compliance or noncompliance with outgoing quarantine restrictions. Owing to the impracticability of fumigating in an efficient manner

those vessels engaged in regular passenger and freight traffic between the port of New York and San Juan, in view of the fact that these vessels were never entirely empty during the time that they remained at San Juan, the bureau authorized the acceptance of the certificates of fumigation issued by the quarantine officer at New York showing that the vessels referred to were fumigated throughout at New York prior to departure, and all such vessels were allowed to come alongside the piers or wharves at San Juan if properly rat guarded and breasted off from the pier or wharf. No vessels arriving with cargo from foreign ports en route to the United States were permitted to come alongside any wharf or pier at San Juan. All such vessels are required to remain at anchor in the open harbor and to discharge or load cargo by means of lighters. The chief quarantine officer advised the bureau by cablegram of the immediate need of additional personnel and material to properly carry out the outgoing quarantine procedure at San Juan, and he was authorized by the bureau to employ the necessary personnel for the work, and the supplies of fumigating materials and rat traps requested were shipped to San Juan by the next United States Army transport en route to Porto Rico from New York. Owing to the large amount of fumigating which had to be done immediately at San Juan, two squads of fumigators—six men to each squad—were at once organized and placed in charge of a medical officer who was employed for the special purpose of assisting in the work of safeguarding the outgoing shipping. Four sanitary inspectors were employed to inspect cargo destined for ports in the United States prior to loading into vessels, and also to see that all the outgoing quarantine restrictions enforced on vessels lying at the wharves and piers were rigidly carried out. Upon the receipt of 300 "official" snap traps, two men from the fumigating squad, in charge of a sanitary inspector were assigned to the work of trapping rats along the entire water front and including all of the large wharf and pier storehouses where cargo was being placed pending shipment to other ports.

In order to avoid any excuse for misunderstanding as to the requirements to be enforced regarding the shipping at San Juan, and to obtain the full cooperation of all the shipping interests concerned to the end that friction may be avoided and the work expedited, it was decided to call a conference of all the local agents and other interested shipping connections in order to discuss the various procedures which must be enforced as regards the shipping, and to formulate a plan whereby the necessary quarantine requirements would be carried out at a minimum of inconvenience and expense to all concerned. The conference was held in the office of the chief quarantine officer, the same being attended by all the leading agents and other shipping interests at San Juan, and a full discussion of all the necessary quarantine procedures was had, and an agreement was made whereby the cooperation of the shipping interests was secured as to the proper carrying out of the outgoing quarantine requirements, which included the following:

- (1) Rat guards of an accepted design to be properly placed on all lines leading from vessels to shore structures;
- (2) vessels to be fended off from wharf or dock not less than 4 feet;
- (3) all cargo nets and similar devices extending between the vessel and shore structures to be removed at night unless in actual use, and also the

gangways and ladders to be raised at night or kept brightly lighted and watched; (4) vessels to be fumigated after discharge of cargo and prior to loading any cargo at San Juan, provided vessels can be fumigated when empty; (5) all wharf inclosures used for the storage of cargo to be regularly cleaned throughout not less than once in every 10 days, and all cargo to be removed therefrom if necessary to effect the proper cleanliness; (6) all entrances to wharf structures to be kept closed when such structures are not required to be open for the transfer of cargo, and the lower edges of all doors to the entrances to be kept properly repaired to prevent the passage of rats; (7) all cargo skids and gangways used during the night to be kept brightly lighted, and not less than one person to watch each skid or gangway to be provided to prevent the passage of rats, and all cargo skids to be promptly removed from the vessels when same are not actually being used to transfer cargo; (8) all cargo received for shipment to the United States to be brought without delay direct to the wharf inclosure and kept free from rats until loaded into vessels; (9) all broken packages of cargo, such as crates, boxes, bales, etc., must not be loaded into vessels until same have been inspected by an authorized inspector of the Public Health Service and his permission obtained to load same into vessels; (10) all railroad cars or trucks used for the transfer of cargo to wharves must be rat proof, and free from defects which may allow rats to harbor therein.

The cooperation of the local harbor officials was requested to prevent the placing of any cargo within 15 feet of the sea wall along the water front.

The cooperation of the shipping interests as regards the proper execution of the outgoing quarantine restrictions has been satisfactory with but one exception. One of the local shipping companies, operating a number of small sailing vessels between San Juan and the subports of Porto Rico, manifested an antagonistic attitude as regards the enforcement of the restrictions on their vessels when lying alongside wharves at San Juan. The officials of this company were several times warned that their failure to strictly comply with the restrictions would result in legal proceedings against the offending vessels of this company, and in view of the fact that notwithstanding the repeated warnings, this company continued to ignore the quarantine restrictions, the matter was reported to the office of the United States district attorney at San Juan with the request that legal proceedings be instituted against the vessels for failure to comply, and this case is at the present time pending. In view of the fact that the origin of plague infection in Porto Rico in 1912 was attributed to the introduction of plague rats in cargo brought to San Juan in Spanish vessels from the Canary Islands, it is now the practice to allow no cargo taken from Spanish vessels at San Juan to be landed until same has been fumigated for the destruction of rats under the supervision of the Public Health Service.

Origin and spread of the present plague epidemic.—An investigation concerning the original focus of infection in Tetuan Street, San Juan, where merchandise has been received which was brought in Spanish vessels from localities known to be plague-infected, suggests that the present outbreak of plague in Porto Rico is probably due to infected rats brought in the merchandise landed from Spanish

vessels. It has also been ascertained that one of the customs warehouses in San Juan where one plague rat was found has been used for the storage of cargo landed from Spanish vessels. The spread of the infection from San Juan to the several small near-by communities is thought to be due to the transmission of plague rats in merchandise shipped overland from San Juan.

One of the most interesting aspects of the present epidemic is the fact that, notwithstanding the fact that many hundreds of rats have been trapped along the water front at San Juan and subjected to laboratory examination, not one rat taken from the water front at San Juan has been found to be plague infected. It is believed that the excellent work done by the Public Health Service at San Juan in 1912 in the matter of rat proofing the entire water front and the adjacent areas has proved to be of inestimable value, and is perhaps the most important single condition which has operated to prevent the present epidemic from reaching more extensive proportions.

MARINE HOSPITAL RELIEF.

The beneficiaries of the service other than war-risk insurance patients have as heretofore received out-patient and hospital relief at San Juan and Ponce, Porto Rico, where contracts are made annually for the hospitalization of suitable cases, those cases not requiring hospital treatment being attended to at the out-patient office maintained by the service. During the year 158 physical examinations were made of seamen and other persons applying for licenses as marine engineers or pilots and of applicants for admission to the Lighthouse Service. The following beneficiaries received treatment during the year: American seamen, 7,328 days; foreign seamen, 56 days; Engineer Corps, United States Army, 443 days; Lighthouse Service, 141 days; Employees' Compensation Commission, 109 days.

WAR-RISK INSURANCE.

The activities of the Public Health Service in providing for the examination and proper treatment of the beneficiaries of the war-risk insurance in Porto Rico has constituted a very considerable part of the work performed by the service during the year, and this work is steadily increasing from month to month. The war-risk insurance patients who require hospitalization are admitted to a private sanatorium located about 3 miles from San Juan, and these patients are constantly under the observation of two acting assistant surgeons of the Public Health Service who devote their entire time and attention to the care and treatment of these beneficiaries. It has been found to be impossible to secure suitable facilities in San Juan for the treatment of patients of the service in a fully equipped hospital, the only such institution located at San Juan being of very limited capacity and its beds always being in great demand by the civilian population. Hence it has been necessary to resort to the limited facilities available for the care and treatment of patients in a private sanatorium. Experience has abundantly demonstrated the desirability of having a hospital at San Juan which is owned and operated by the Public Health Service. During the year war-risk insurance beneficiaries received 35,141 days' sanatorium treatment.

MEDICAL INSPECTION OF ALIENS.

The medical inspection of arriving aliens is performed on board vessels immediately upon the completion of the quarantine inspection: The Immigration Service offers no facilities whatever for the observation and examination of aliens arriving at San Juan, and the medical examiner is expected to make diagnoses of dangerous or loathsome contagious diseases without being allowed any opportunity to keep suspected persons under observation in quarters provided by the Immigration Service. During the year there were medically inspected 17,493 alien passengers and 12,220 alien crews. Medical certificates were issued as follows: Four, class A-1; 12, class A-2; 51, class B.

VIRGIN ISLANDS.

Passed Asst. Surg. D. C. Turnipseed, chief quarantine office, St. Thomas, reports as follows:

(a) *Incoming or domestic quarantine.*—Quarantine is the most important service operation in the Virgin Islands. The medical officer in charge at St. Thomas acts as chief quarantine officer for the Virgin Islands, and has under his supervision all quarantine matters at other ports.

At the only other two ports in the Virgin Islands the service maintains quarantine inspection stations. Medical officers of the United States Navy continue to act as quarantine officers in Frederiksted and Christiansted, and St. Croix, in addition to their other duties, as there are no civilian physicians available as acting assistant surgeons.

In St. Thomas the two-story building located on Main Street is still leased, and is used as a quarantine office, out-patient dispensary, and laboratory. A warehouse, located near the water front, is also leased and is used for the storage of drugs and chemicals, disinfectants, and unserviceable property.

At St. Thomas is maintained the only quarantine station in the Virgin Islands. A site has been selected at East Point, formerly used by the Danes as a quarantine station, and later, during the period of the World War, as a barracks for the United States Marine Corps.

This property, under the control of the harbor board of St. Thomas, has been leased for a period of five years, with the privilege of purchase in the meantime, by the Public Health Service. The proposed quarantine reservation consists of approximately $7\frac{1}{2}$ acres. There are in all eight buildings on the station.

During the fiscal year just closed considerable improvements have been made on the property and buildings. The grounds have been cleared of brush and weeds; the buildings already located there have been remodeled and painted; partitions have been removed and rooms enlarged, so that the buildings may serve the purpose of a quarantine detention barracks.

It is the anticipation and intention of the service to furnish these buildings at an early date and install apparatus for fumigation and disinfection purposes.

With the exception of one case of leprosy, microscopically unconfirmed, isolated on board the Italian S. S. *Albaro*, en route from Vera Cruz, Mexico, to Genoa, Italy, no quarantinable diseases have arrived at Virgin Island ports during the fiscal year just closed.

Vessels arriving in the Virgin Islands have gradually diminished until during the last three months there have been inspected and passed only 12 or 15 steam vessels from foreign ports. This condition is probably due to the recent labor disturbance in the United States shipping centers. However, there has been a great increase in the number of small vessels and schooners entering ports here for quarantine inspection. This latter increase of arrivals is due, first, to the reappearance of bubonic plague in Porto Rico, and, secondly, to a recent congressional amendment to the act of February 15, 1893, section 2 (United States quarantine laws) requiring vessels from one United States insular possession to another to produce a consular bill of health at the port of destination.

(b) *Consular quarantine.*—In accordance with the quarantine regulations, ports in the insular possessions of the United States are considered for administrative purposes as foreign ports, and vessels departing therefrom destined to a United States port are required to obtain consular bills of health and comply with the restrictions which are imposed on vessels at foreign ports of departure when sailing for a United States port. In foreign ports, bills of health are issued by the American consul. In the insular possessions of the United States this duty is performed by officers of the Public Health Service.

The following transactions have occurred in the Virgin Islands during the past year:

At St. Thomas, number of bills of health issued.....	279
At Frederiksted, number of bills of health issued.....	38
At Christiansted, number of bills of health issued.....	14

In addition to the above, many port sanitary statements have been issued to vessels destined from the Virgin Islands to foreign ports, when requested by their agents or masters. These statements, when viséed by respective consuls, are accepted in foreign ports as bills of health.

RELIEF FOR SERVICE BENEFICIARIES.

This is furnished at St. Thomas, V. I.

(a) *Hospital relief.*—The Public Health Service maintains a contract with the local municipal hospital for the care of its beneficiaries, attention and treatment of whom is rendered by the service medical officer stationed at St. Thomas.

During the year 58 patients have received treatment. Total number of days' treatment, 1,107.

(b) *Out-patient relief.*—Three hundred and sixty-five patients applied for treatment at the out-patient dispensary during the year. Total number of examinations made, 401; total number of times relief was furnished, 844.

IMMIGRATION SERVICE.

The medical examination of aliens arriving in the Virgin Islands is under the supervision of the Public Health Service officer. Only during the first two months of the fiscal year just closed was this duty performed. After this time medical inspection of immigrants was discontinued, there being no inspector assigned to duty in the Virgin Islands by the Department of Labor.

During July and August, 1920, there were—

Number of alien crew examined.....	639
Number of alien passengers examined.....	560

Of these, 17 were certified, as per immigration regulations, as follows:

Class A (II), number certified.....	11
Class B, number certified.....	4
Class C, number certified.....	2

Many tropical diseases excludable under the United States immigration laws are prevalent among the native population.

LEPROSY.

At the present time there are 71 lepers segregated at the lepro-sarium at Richmond, near Christiansted, St. Croix, Virgin Islands.

FILIARIASIS.

Seventy-two cases have been reported during the past fiscal year as being present in St. Croix.

ENTAMEBIC DYSENTERY.

Forty-seven cases occurred in St. Croix and two in St. Thomas.

TRACHOMA.

Forty-four cases were reported from St. Croix and two from St. Thomas.

TUBERCULOSIS.

Although tuberculosis is not excessively prevalent in the Virgin Islands, it has always been observed by the older Danish physicians here to progress to rapid termination, once a person develops it. Eighteen cases were reported from St. Croix and 9 from St. Thomas as occurring during the fiscal year just closed.

Malaria and dengue appear to be of rare occurrence in the islands. Only 6 cases of dengue and 5 of malaria were reported during the past year.

VENEREAL DISEASES.

This disease continues to be one of the scourges of the islands. There were reported during the past year—

At St. Thomas:	
Chancroid, number of cases.....	28
Gonorrhea, number of cases.....	44
Syphilis, number of cases.....	24
At St. Croix:	
Chancroid, number of cases.....	11
Gonorrhea, number of cases.....	89
Syphilis, number of cases.....	49

TYPHOID FEVER.

All of the native population of the Virgin Islands being protected by previous inoculations of typhoid vaccine, not a single case of typhoid fever has been reported as having occurred during the past year.

YELLOW FEVER.

As in all other of the United States insular possessions, the aedes (stegomyia) calopus mosquito is present in the Virgin Islands.

MISCELLANEOUS DUTIES AND ASSISTANCE RENDERED OTHER SERVICES.

1. *Physical examinations*.—(a) Examinations of merchant seamen have been made when requested by masters of vessels of the United States merchant marine at St. Thomas.

(b) One officer in the Coast and Geodetic Survey was examined at his own request.

(c) There being only small launches and motor dories in the Virgin Islands, there is no law requiring pilot's license.

2. *Lighthouse service*.—The keeper of the Myhlenfeldt's Lighthouse, located on the quarantine reservation at East Point, is allowed to occupy one of the unfurnished rooms on the station so long as it is not needed.

3. *Customs Service*.—The customs and quarantine officers come in close contact and the most cordial relations exist. Mutual use of each other's launches by employees is of almost daily occurrence.

4. *Department of health, sanitary service*.—The Quarantine Service works hand in hand with the health department in its efforts to control the sanitary conditions and health of the islands. Statistical data of information each to the other is furnished when requested, health topics are discussed, and views interchanged at frequent intervals. Typhoid and smallpox vaccine are furnished by one to the other when requested.

5. *Marine Corps*.—Upon request from the officer in charge, certain quarters and bedding in the marine barracks at St. Thomas were fumigated with cyanide for the destruction of vermin.

VERA CRUZ, MEXICO.

Acting Asst. Surg. Percy Ahrons reports as follows:

The fact that Vera Cruz is the gateway to the interior of Mexico will always be at least a potential danger to the United States. Vera Cruz is the center of all coastwise trade; a number of small motor crafts ply between Vera Cruz and the small seaport town, carrying both freight and passengers, and most of these ports are 3 to 4 day passages.

The Mexican Government has several steamships which reach the larger places, as Tampico, Frontera, Progreso, etc.; they are likewise engaged in passenger trade. Therefore, with the present quarantine restrictions, cases of all classes of disease are likely to be imported at any time.

Acting Asst. Surg. John A. Hedrick died from yellow fever during the month of September, 1920, and quarantine regulations were carried on by the American consul. All ships sailing for the United States were fumigated under his supervision. During the period between the death of Acting Asst. Surg. Hedrick and April 6, 1921, on which date Acting Asst. Surg. Percy Ahrons reported for duty, 168 vessels were fumigated. From April 6 to June 30, 72 vessels were fumigated, 360 passengers examined and passed, and 2,800 crew were inspected and passed.

Port regulations were recommended to bureau, which were adopted and put in force June 7. This was found necessary from the fact that steamship companies were working along the line of least resistance, in many instances absolutely disregarding regulations, as there was no one to supervise them. Fumigation of vessels is carried out according to regulations as to time of exposure and quantity of cyanide per 1,000 cubic feet. Rats are not collected, except in saloon and cabin, and where any are found they are turned over to local authorities for examination.

The campaign being waged against yellow fever by the International Health Board has accomplished much. The mosquito index is said to have been reduced 75 per cent. To date no cases have been officially reported, but there have been two cases, with one death, unofficially reported.

GENERAL ACTIVITIES IN EUROPE.

Asst. Surg. Gen. Rupert Blue, in general charge (stationed at Paris), reports as follows:

The aftermath of the European war and the conflict between Poland and the Bolsheviki of Russia was accompanied by a disruption of the normal conditions of civilization which was directly responsible for the spread of epidemics in eastern Europe and particularly of exanthematic typhus, smallpox, and cholera.

The destruction of hundreds of thousands of dwellings, the shifting of great masses of the population, the lack of soap, fuel, and clothes, combined with the effects of a rigorous climate, were responsible for such a diffusion of body vermin among the peoples of eastern Europe as has not been known for many generations.

Out of these countries a formidable exodus commenced and its end is not yet in view. Hundreds of thousands have proceeded to ports of embarkation en route to the United States, bringing with them from their overcrowded hovels and shacks their bedding and rags.

At some ports of embarkation an examination of these persons on their arrival showed that over 75 per cent of them were heavily infested with body and head lice.

Since these emigrants were arriving directly from typhus and smallpox infected communities it can be readily understood that the urgent and immediate task of the United States Public Health Service was to see that all were vaccinated against smallpox, thus protecting them as well as preventing the importation and spread of the disease throughout the United States, and also to see that all were freed of vermin from their heads, bodies, clothing, and from their bedding and other baggage.

This task has been made more difficult by reason of the fact that a large proportion of the steerage class from Galicia, Poland, and other provinces of old Russia have apparently become so accustomed to vermin that a human being without lice is a rare specimen in their eyes. Such persons naturally object to measures of disinfection, particularly with reference to bathing, the application of soap, and the sterilization of their effects. Not infrequently louse-infested clothing is surreptitiously withheld from the sterilizers and found in their possession after the delousing process has been completed. To many the cleansing bath taken at the port of embarkation is the first

of their lives and the anticipation of the event is, of course, worse than the realization. It is not improbable that some of these uneducated people may look upon the embarkation bath as a form of persecution.

At the commencement of the fiscal year the situation just described consisted in the continuation of the extensive epidemic of typhus fever in Poland and the Baltic States of Lithuania, Latvia, Esthonia. In Poland alone 161,846 cases of typhus were reported for the year 1920. Typhus was present in the central European and Balkan States, but to what extent could not be definitely ascertained. Smallpox was occurring everywhere, amounting to epidemic proportions in Sicily and in some Provinces of Spain. Cholera was reported in Poland, the result of military contact with the Bolsheviks; the infection has apparently disappeared as a result of the adoption of active measures including the vaccination of contacts.

The sanitary situation in western Europe has been very satisfactory in so far as quarantinable diseases are concerned, with the exception of an outbreak of plague in Lisbon in October and November, and in Paris in August and September, 1920.

The work of the Paris office for the fiscal year has been a continuation on a more extensive scale of the work of the preceding year and has consisted of the following activities:

Centralization of information as to the varying sanitary status of Europe.—(a) Communication is maintained since the preceding year, and weekly reports are received from 40 consuls scattered throughout Europe.

(b) Communication is likewise maintained and periodical information received from the American Red Cross with headquarters in Paris and whose physicians and workers are scattered throughout eastern and central Europe.

(c) Accurate information is received twice a year from the delegates to the International Health Office which meets in Paris; most of these are the chiefs of their respective health services and represent most of the European countries.

(d) All of this is confirmed and completed by personal tours and inspection throughout Europe.

Notwithstanding the availability of these sources of information it has been found impracticable to obtain accurate intelligence of the presence of quarantinable disease in central and southeastern Europe.

In view of the known prevalence of quarantinable diseases in Poland and Russia, and the lack of information as to their absence in certain countries situated east and south of Germany, Switzerland, and Italy, including Asiatic and African Mediterranean or Black Sea ports, it was deemed advisable to consider steerage and second-class passengers originating therein as having been definitely exposed to typhus exanthematicus and smallpox, and to impose against all departures from those countries the minimum requirements of delousing and vaccination. The wisdom of this measure was fully confirmed during the fall and winter of 1920-21 upon the arrival at New York of vessels from Trieste, Rotterdam, Antwerp, and Danzig carrying cases of typhus fever among emigrants from those countries.

Constant contact is maintained between the bureau and the Paris office, by letter and cable on the one hand, and between the Paris office and the medical officers and consuls on the other, and the enforcement or relaxation of the necessary measures are adequately adjusted and immediately transmitted to the various officials concerned.

At the commencement of the fiscal year service officers had been stationed at only a few ports, such as Naples, Rotterdam, and Danzig—the stream of emigration, released from passport difficulties, was just getting under way.

By personal inspection of ports and contact with transportation managers, the latter had been advised personally, as well as officially through the respective consuls, of the necessity of providing facilities for delousing, vaccinating, and the inspection of the emigrants proceeding in large numbers from typhus-infected countries to the United States. In accordance with these instructions, hotels for their reception were leased or constructed, and bathing, disinfection, and inspection facilities were installed. Hotels, known as “clean” hotels, were provided for their accommodation whilst awaiting embarkation subsequent to delousing.

It became necessary to secure the services of additional officers for the supervision and sanitary control of emigration through the principal ports of embarkation, and it was equally important that officers so employed should have an opportunity to study the application of the regulations. The port of Rotterdam was selected as a suitable place for this study, not only because of its central location but chiefly because it was the favorite place for the embarkation of large numbers of vermin-infested emigrants. As occasion required these officers have been stationed at Danzig, Christiania, Goteborg, Copenhagen, Libau, Hamburg, Bremen, Rotterdam, Antwerp, Havre, Cherbourg, Liverpool, London and Southampton, Barcelona, Trieste, Naples, Messina, Palermo, Piraeus, and Constantinople. Twenty-one principal ports are thus covered. The duties of these officers are to supervise the application of the regulations, to advise with the transportation officials as to the needs for and suitability of facilities, and to inspect the emigrants and vessels in order to secure clean passengers and clean ships. Instructions are issued from time to time for their information and guidance.

Beginning March 25, 1921, by order of the bureau all steerage and second-class passengers originating in typhus-infected countries were required to undergo 12 days' detention subsequent to delousing and disinfection of their effects. As a result, the housing facilities under the control of the transportation companies at some of the ports were overcrowded and temporary expedients had to be resorted to in order to meet the situation. Passenger vessels, some of which had been superannuated years ago, were called back into service and used as hotels at Antwerp and Cherbourg. The companies were also compelled to give serious consideration for the first time to the purchase and construction of permanent hotel accommodation for the ever-increasing tide of emigration.

On June 10, however, because of the decline of typhus incidence in the above-mentioned countries and the advent of warm weather in the United States, this order was modified so that 14 days were

required from the completion of disinfection at the ports of embarkation to the date of arrival at American ports. This change affected very favorably the Mediterranean traffic in view of the fact that vessels departing from southern ports seldom, if ever, make the passage to New York or Providence under 14 days. Detention, therefore, was unnecessary at Naples or Marseilles, but quite necessary at northern ports, from 5 to 8 days, in order to complete the period of observation subsequent to delousing.

Because of the fact that the steamship agents apparently showed a lack of appreciation of the importance of enforcing the foregoing regulations and the further fact that their employees were untrained in the methods of detecting verminous passengers, it was deemed advisable to call a conference for the purpose of informing them of the determination of the department to admit only clean ships and clean passengers at American ports. Such a conference was held on February 17, at No. 10 Rue de l'Elysee, Paris, which was attended by the representatives of the following steamship companies: Lloyd Royal Hollandais, Holland American Line, Compagnie Generale Transatlantique, Fabre Line, Cunard Steamship Co., Canadian Pacific Line, Royal Mail Steamship Co., United States Mail Steamship Co., Compagnie Furness, Baltic American Steamship Co., American Line, Red Star Line, and White Star Line. During the course of the conference the humanitarian aspect of this question, in so far as it relates to emigration, was brought to the attention of the representatives of these companies. The various details of delousing were explained, particular care being taken to point out the weak spots and to insist upon the fact that good results can only be secured by the efficient cooperation of a trained and competent personnel.

Whilst at most ports the work was well done, the temptation on the part of the companies to rush and to overcrowd was at times irresistible. In one instance, owing to most difficult local political conditions, the medical officer was compelled, after due warning, to discontinue the certification of the work performed. The bureau, in order to make it plain that the regulations must be complied with, forwarded instructions which authorized the medical officer to withhold his signature from the bills of health, and the Secretary of State, upon request, authorized the consuls to withhold the bills of health whenever the regulations were not enforced to the satisfaction of the medical officer. The officers and consuls were immediately advised by wire and by the following letter:

PARIS, 10 RUE DE L'ELYSEE,
February 11, 1921.

SIR: You are informed that the following cable has just been received:

"Department has requested Sec. State to instruct consuls withhold bills of health at ports where medical officers stationed whenever delousing measures unsatisfactory. Bureau advise such instruction issued. Inform officers to recommend issuance bill of health only when delousing measures satisfactory in every respect.

"CUMMING,
"Surgeon General."

In accordance with the provisions of the above cable you are instructed to inform (through channels) the steamship companies embarking second and third class passengers at your port for the United States that hereafter each individual of the second and third class must be absolutely free of lice and

the eggs of the same; that in order to obtain this result the following procedure, insofar as practicable, shall be carried out:

(1) The United States Public Health officer must examine each individual separately and may be assisted for such examination by one or more experienced male or female assistants.

(2) That such second and third class passengers as are found to have lice or the eggs of the same on their head, body, clothing or baggage must be detained for a sufficient period of time to secure their absolute freedom from said lice or eggs.

(3) In the event that any person having been found to have lice or eggs, as stated above, be permitted by the company or any person acting for said company to embark before having been approved by the officer of the United States Public Health Service, said officer shall, in compliance with Bureau instructions, request the American consul to withhold the bill of health for that vessel.

(4) The quarters occupied by second and third class passengers aboard the vessel shall be inspected by the service officer for the purpose of ascertaining that the bedding and quarters are free of lice or the eggs of same, and that measures adequate for the destruction of said lice and eggs have been adopted and performed insofar as practicable; such an inspection shall be made of quarters and bedding in the hotels accommodating clean passengers awaiting embarkation.

Respectfully,

RUPERT BLUE,
Assistant Surgeon General.

COOPERATION WITH THE CONSULAR SERVICE.

It was neither practicable nor in conformity with ordinary exercise of reasonable economy to station medical officers at all ports of embarkation. At some ports a vessel might take on a few hundred passengers once a month, or, even with weekly sailings, only a few hundred for the whole month; again, at some ports only passengers from western Europe embarked, such passengers had not been exposed to the infection of typhus fever. In these instances the consul was requested to induce the steamship companies to appoint and pay for the services of a local physician who should be "persona grata" to the consul, i. e., a physician in whom this official could have full confidence. Whenever the embarkations, either by numbers or character, required it, or if the consul so requested, the appointment of a medical officer was recommended to the bureau.

It is but just to state here that the consular officers in Europe have without exception cooperated to the fullest extent with the Public Health Service, and have conferred with its officers in the enforcement of measures designed to protect the public health of the United States. These consular officers have observed and notified this office of attempts to evade the application of the United States quarantine regulations.

THE PROBLEM OF TRANSMIGRANTS AND TRANSIT PASSENGERS.

In accordance with the British aliens act passengers originating in continental countries and embarking at British ports for the United States or Canada are known as "Transmigrants." Those who embark at Copenhagen, Goteborg, or any other port, under similar conditions, are designated by the transportation companies as "Transit passengers." Owing to the lack of facilities at the ports above mentioned this indirect traffic required special consideration and arrangements had to be made whereby delousing could be done at

Danzig, Hamburg, Rotterdam, or Antwerp. Service officers stationed at these ports were authorized to supervise this work upon request and to issue individual delousing and vaccination certificates, provided that the companies would agree to safeguard such passenger against reinfestation while in transit. A final inspection was required, however, at the ports of direct embarkation.

VACCINATION OF STEERAGE AND SECOND-CLASS PASSENGERS.

Not one of the many thousands of emigrants have left Europe for the United States without being subjected to vaccination against smallpox, excepting when actual inspection by the medical officer showed the evidence of recent successful vaccination. This action was rendered necessary not only from the fact that smallpox has been prevalent in eastern and southern European countries, but because even some western countries whose health organizations have not been impaired by the war have had many cases of smallpox. These outbreaks have revealed the presence of many unvaccinated persons.

In view of the presence of bubonic plague in a number of Mediterranean ports the following letter was addressed to medical and consular officers.

This letter aroused the interest of consuls and others concerned, and considerable correspondence has ensued relative to the application of the suggestions in specific instances, and questions were asked as to the method of fumigation of vessels at Alexandria, Piraeus, Genoa:

Bubonic plague has recently been reported from a number of Mediterranean ports. Human cases of plague occurring among residents of a locality indicates a more or less extensive epidemic, or, as it is called medically, epizootic of plague among the rats of that locality.

Plague-infected rats, dead or alive, may reach a vessel either (a) by means of the lines making the vessel fast to the quay or dock, (b) by the gangway at night, and (c) within bales of merchandise. A recent outbreak of plague in Barcelona was traced to infected rats contained in bales of hides from India.

Arriving in the United States, plague infection among rats on a vessel starts an epizootic among the rats of the ports and, sooner or later, residents are infected. Quite apart from the human sickness, suffering, deaths involved, the eradication of plague from a locality is a most expensive and troublesome process.

In order to prevent the importation of plague and in accordance with the quarantine laws and regulations of the United States (Ch. X) you are respectfully requested to require the following measures to be adopted by masters of vessels who apply for a bill of health.

At ports or places suspected of plague infection in rodents (1) every precaution shall be taken to prevent rats (mice) from getting aboard.

Vessels sailing from such ports shall be simultaneously fumigated in all parts, preferably when empty, for the destruction of rats, and this is best accomplished by periodic fumigation.

If the vessel lies at a dock, all connecting lines should be guarded by inverted cones or disks not less than 3 feet in diameter, and so fixed as to be always at a right angle to the line to which it is attached.

The cone or disk shall be so applied that there shall be no open space in the center of said cone or disk through which rats may pass.

Brooms and other makeshifts are inefficient. From sunset to sunrise the gangway shall either be removed or, if kept, shall be well lighted by electric light or other efficient means of lighting.

Articles which harbor or are liable to harbor rats or rat fleas should not be shipped until freed of such vermin, either by the use of chemicals, fumigation, or by preventing the access of rats. The nature of the merchandise and the

place and method of stowing prior to shipment must be considered in determining its liability to be a rat or vermin carrier, thus crated cargo, bags of grain, etc., so stowed as to be used as nesting places for rats should preferably have been previously stored in rat-proof warehouses. Articles of cargo in open crates should be carefully inspected to determine freedom from rats, and, at the discretion of the inspector, may be rejected for shipment if considered as rodent infected. When the cargo of a vessel consists of grain or other rat food, extra precaution should be taken to prevent rats from going aboard.

Human cases occurring among residents should be considered as a proof of an existent rodent infection.

ATTENDANCE AT INTERNATIONAL CONFERENCES.

(Office International d'Hygiene Publique.)

The annual meetings of the Office International d'Hygiene Publique, founded in 1903 by international agreement, have been attended by the delegates for 20 or more Governments. As in other years, meetings were held in Paris in October and April. The most important subject discussed at the April meeting was the revision of the convention of 1912. This convention, whilst better than its predecessors, is deficient in several essentials deemed necessary for the protection of the United States and other countries, with special reference to the rôle of rodents in the transmission of plague from port to port, the determination of cholera carriers among emigrants departing from infected localities, and the failure to provide for the notification of typhus exanthematicus.

These amendments have been proposed by the service through its official delegates, together with a request from this Government for a revision of the convention. The principle of revision has been accepted by the other signatory powers to an extent that will insure its consideration and eventual adoption. Considerable progress in revising the text has been made by the committee appointed by the President, but in view of the necessity of obtaining the assent of all delegates to the proposed changes the work is necessarily slow. The committee's suggestions will be submitted at the October meeting to the committee of the whole for its consideration and final recommendation.

Other subjects of importance considered are the provision of facilities in ports for the treatment of seamen of the merchant marine while suffering from venereal diseases in foreign countries, and also the adoption of uniform regulations governing the hygiene of crews' quarters. Questions under study are the improvement of industrial sanitation and the relation of tuberculosis to certain industries.

The value of the office to the United States, as well as to other countries, might be considerably increased were the appropriations available made commensurate with the purpose. Reference is made to the establishment in the office of an active and efficient bureau for the collection and rapid dissemination of information relative to the appearance and progress of epidemic diseases.

THIRD DECENNIAL REVISION OF THE NOMENCLATURE OF DISEASES AND CAUSES OF DEATH.

Upon the suggestion of the International League of Red Cross Societies the French Government in June, 1920, invited the other pow-

ers to send delegates to a conference for the purpose of revising the International Nomenclature of Diseases and Causes of Death. The conference was held at Paris in October, 1920, and was attended by 70 delegates from 40 countries, the United States being represented unofficially by Dr. William H. Davis, Census Bureau, Department of Commerce; Asst. Surg. Gen. Rupert Blue, Public Health Service; and Col. Henry A. Shaw, Medical Corps, United States Army.

Port.	Passengers inspected.	Vaccinated.	Bathed and deloused.	Pieces of baggage disinfected.
Antwerp.....	24,292	23,526	20,781	10,170
Boulogne-sur-Mer.....	2,828	2,828	2,828	3,700
Cherbourg.....	38,231	29,486	17,922	21,932
Copenhagen.....	5,165	.....	1,043	.....
Danzig.....	50,865	30,536	41,115	16,446
Göteborg.....	6,388	6,181	798	1,294
Hamburg and Bremen.....	14,867	14,867	14,799	20,426
Havre.....	68,918	68,894	51,725	105,000
Liverpool.....	10,251	957	1,518	3,073
Naples.....	109,778	105,000	100,000	85,775
Patras.....	4,032	4,032	194	4,793
Piræus.....	19,642	19,642	14,232	13,086
Rotterdam.....	34,919	34,919	28,150	10,020
Trieste.....	2,810	2,761	2,767	1,483
Total.....	392,986	343,929	297,872	297,198

MEDICAL INSPECTION OF ALIENS.

During the fiscal year ended June 30, 1921, there were examined by medical officers of the Public Health Service 1,137,682 immigrants for the purpose of detecting physical or mental defects or diseases, as provided for in the United States immigration laws. This number of immigrants, as compared with 762,127 for the previous year, shows an increase of 375,555. In addition to the immigrants examined, there were also inspected 851,928 alien seamen, as provided for in the act of February 5, 1917.

The total number of aliens certified to as having defect or disease was 46,870. Of the alien seamen found afflicted, there were 92 certified for tuberculosis or mental conditions; 4,714 as being afflicted with either loathsome contagious diseases or dangerous contagious diseases (including trachoma, gonorrhea, and syphilis); 1,793 for conditions that would affect their ability to earn a living; and 492 for minor defects. Of the alien passengers certified to 730 were found to be suffering either with mental defects or tuberculosis; 2,451 as being afflicted with loathsome contagious or dangerous contagious diseases; 28,350 as having some physical defect which would interfere with their ability to earn a living; and 8,248 for minor physical defects. The number certified was an increase of 21,761 over that of the preceding year.

The number of officers assigned to the medical inspection of aliens has varied during the year, but on an average some 90 officers were exclusively engaged in this work, and in addition a number of officers at marine hospitals and quarantine stations also performed medical inspection of immigrants. Service officers at American consulates at a number of foreign ports made medical examinations of prospective immigrants in order that the latter might be appro-

priately advised as to any condition which might operate to their exclusion upon arrival at a port of the United States. The performance of this examination at the port of embarkation in a certain number of cases served to prevent the embarkation of mentally or physically defective persons who would have been subject to deportation upon arrival at the United States, and thus these people were saved the expense of the trip, with other unnecessary hardships. Steamship companies were also enabled, through this examination, to avoid penalties provided in the United States immigration law against common carriers for bringing to the United States ports aliens suffering from certain specific mental or physical defects.

At most of the ports of entry the facilities afforded for the medical examination of aliens are totally inadequate. At a majority of ports examination has to be performed on vessels, with totally insufficient equipment and under most unfavorable conditions. At Ellis Island, port of New York, there has been a progressive improvement during years past in the facilities afforded for the examination of aliens, and also in the methods employed in the examination. Many aliens, however, notably those arriving first and second class, as well as alien seamen, are examined on board vessel. This is an arrangement which is distinctly prejudicial to the performance of efficient physical or mental examination of a person. There is generally a lack of privacy and insufficient illumination. Because they have lived under a better hygienic condition, are better nourished, and of a sufficiently higher intelligence to exercise a certain amount of self-care, cabin passengers as a rule may be considered as suffering from a much smaller percentage of defects or diseases than is found amongst steerage. Nevertheless not infrequently mentally or physically defective aliens, who ordinarily travel in steerage, engage second class, or even first class, accommodations, thinking that it will thus be easier to evade detection upon arrival at a port of the United States. It seems probable that the efficiency of the examination could be promoted by remanding second-class passengers to Ellis Island for examination there, as now is being done with respect to steerage passengers. Aside from other objectionable features connected with the medical examination of persons on board vessels, a lack of transportation facilities greatly impeded the work, and necessitated the assignment of a much greater number of medical examiners on the boarding division than would have been required if there were sufficient transportation facilities available to immigration service at the port of New York. The one tug with which that service is provided is wholly insufficient.

As a matter of cooperation, and in order to effect a certain amount of economy without lessening of efficiency, tentative arrangement has been effected whereby one medical examination performed on board the vessel before it leaves quarantine anchorage serves for both immigration and quarantine purposes. The arrangement is still in the stage of development, but promises to result in considerable saving of personnel. A similar arrangement has been in effect for the past two years at the port of New Orleans. At that place the quarantine officer makes medical examination for immigration purposes, the work being done in connection with the inspectors of the Immigration Service, who are quartered at the quarantine station. Formerly the medical examination of alien seamen and alien

passengers at the port of New Orleans was performed on board arriving vessels at the New Orleans wharves, scattered up and down the river for a distance of 25 miles. The expense of transportation and maintenance of sufficient force of inspectors was very naturally much greater than under the present arrangement.

The physical and mental condition of aliens arriving at the Atlantic seaboard from Europe during the past year has probably been of the lowest standard in the history of immigration, and withal there has been a greater laxity than ever with respect to the enforcement of the provisions of the immigration law covering the deportation of the physically and mentally unfit. Of those detected upon mental examination as having mental or physical defects that would, under the law, render them mandatorially deportable, only 50 per cent were deported. Of some 20,000 certified to as having physical defects to interfere with their ability to earn a living, somewhat less than 500 were deported. No doubt the prospect of medical examination upon arrival has its deterrent effect both as to the prospective alien and also as to the steamship companies engaged in trans-Atlantic transportation, but it is nevertheless a fact that year after year a very considerable number of aliens arrive at ports of the United States with conditions which could easily have been detected at the European port of departure. It is a rather striking commentary on condition of affairs that some of these infected aliens knowingly embark for the United States with every expectation of being able to acquire admission to the country despite their disabilities.

Under existing conditions at immigration stations the detection of mental defects and a very considerable percentage of physical defects can be accomplished only by the most conscientious performance of duty by medical examiners, and when they realize the extent that their endeavors in detection of the mentally and physically unfit have been nullified, it is extremely discouraging, even demoralizing.

Unless greater force be given to the provisions of the immigration act with respect to the exclusion of physically and mentally disqualified, the medical examination may eventually become chiefly a matter of statistical interest.

There has always been more or less speculation as to what results could be obtained by subjecting each alien to a rigid physical examination, to be performed divested of his or her clothing. The manner in which medical examination of aliens has been conducted during past years, although by no means superficial or insufficient, has had to be, nevertheless, cursory, in order to coordinate the procedure with the general immigration examination. In 1904 a board was appointed for the consideration as to the advisability of instituting the disrobement of all aliens at time of examination, and after study of the situation the board recommended adversely against the adoption of such a practice. During the fiscal year 1915, on account of reduced immigration, it was found possible to undertake an intensive examination, at varying intervals, of an entire shipload of immigrants, who were examined in private rooms, divested of clothing, the examination being on a parity with that required incident to examination for life insurance. Of 11,794 persons so examined, the percentage of "dangerous contagious diseases" detected was practically the same as the percentage detected by the routine

examination of a corresponding group. Of this 11,794 given a special examination, however, there was a substantial increase in the percentage detected as afflicted with "loathsome contagious diseases," which included gonorrhea, syphilis, favus, ringworm of the scalp, ringworm of the nails, etc. It is noteworthy, however, that only 37 cases of these diseases were discovered in all of the 11,794 persons examined. This is specially to be noted, for the reason that there have been many self-constituted critics who have asserted that if an intensive examination of arriving aliens were carried out there would be detected a very large number of cases of venereal disease. In the month of July, 1921, 11,000 immigrants were given intensive examination at Ellis Island, performed with removal of clothing, and of all this number only 43 were found to be afflicted with venereal diseases. It is the policy of the Public Health Service to carry out as intensive examination of arriving aliens as the facilities that are provided may permit, but it should be clearly evident from a study of the above figures and the methods employed during past years in the medical examination of immigrants that the procedure as carried out is reasonably satisfactory for the purpose for which it is employed. In the examination of several hundred thousand persons every year, it can not be expected but that a certain number of mentally or physically defectives will evade detection.

The medical inspection of alien seamen either on foreign vessels or American vessels was continued in the same manner as in previous years. In view of the character of their calling, it can readily be understood that very few alien seamen were certified for physical defects, and that most of the defects detected were in the nature of acute infections, such as venereal diseases, trachoma, favus, etc.

One of the most serious defects in the immigration system, however, is the condition obtaining along the Mexican border. Incoming travelers are required to present themselves at immigration ports of entry, of which there are some six or seven over the long stretch of territory between Brownsville, El Paso, and Tia Juana on the Pacific coast. It is highly probable that the majority of aliens who are convinced that they would experience no trouble in being admitted to the United States proceed through the regular ports of entry. It also seems reasonably certain that a very large majority of aliens suffering from deportable conditions have ample opportunity to secure clandestine entry into the United States. It is a well-known fact that along the southern boundary of the United States a great many persons secure clandestine entry because of the desire to evade either immigration restrictions, customs requirements, or for the evasion of some other United States statute.

To meet this situation an effective border patrol should be instituted between Brownsville on the Gulf and Tia Juana on the west coast. It would not be necessary, however, that this long stretch of border would have to be intensively patrolled, but those quite familiar with the situation express the opinion that the objective could be served if strategic sections of the border were kept under surveillance. There are many localities so barren and so inaccessible that natural conditions discourage all attempt to travelers proceeding through such territory in order to effect entry into the United States. It is very probable, however, that in such a patrol force at least several hundred men would be required in order to function efficiently. The

Customs Service, Immigration Service, and the Public Health Service (quarantine service) at present maintain guards at several points along the border, chiefly in the vicinity of the ports of entry, and while they serve some useful purpose, the inadequacy of the force employed necessarily restricts the general objective sought. These patrol forces do have some deterrent effect, but chiefly operate for the greater inconvenience of those who desire to violate the law regulating entry into the United States. These latter must necessarily, under the conditions, proceed just so much farther from the port of entry in order to evade the patrol forces. If two or three squadrons of Cavalry could be assigned to patrol duty, the enforcement of customs, immigration, and quarantine laws on the border would become more effective, and this without any additional expenditure on the part of the United States Government.

Another very pressing need of the Immigration Service is hospital facilities at various ports of entry for the care and treatment of aliens who are temporarily detained either pending their deportation or a determination of their status. The hospital facilities at the immigration station at New York are sufficient for general administrative purposes, and the hospital is exceptionally well equipped and modern in every sense of the word. The hospital at Angel Island (port of San Francisco) provides fairly satisfactory facilities for a limited number of patients, but it is by no means as spacious as it should be for the character of immigration entering the port of San Francisco. The hospital facilities at Boston are likewise wholly insufficient, necessitating the distribution of sick or diseased immigrants to various city institutions. At practically all other ports of the United States, both on the coast line and on the international boundary, there is not even a pretense of an immigration hospital, and when it becomes necessary to provide hospital treatment for detained aliens, United States immigration stations have to depend on such local institutions as may have available accommodation. The practice of providing hospital treatment for diseased alien seamen while the vessel is in port has been objectionable for various reasons. It absorbs a certain percentage of hospital facilities at our ports, with consequent inadequacy of hospital facilities for local citizens. The practice further requires more or less dissipation of administrative effort on the part of immigration inspectors and medical examiners, who devote much time in visiting these hospitals. The fact that such detained aliens are only nominally under custodial restraint also creates certain potentialities for the spread of the infection. Venereal cases, persons with trachoma, favus, and other infectious diseases temporarily placed in local hospitals for treatment have the same opportunity for leaving the institutions as other patients, an opportunity that is taken advantage of by those persons who are not bedridden.

At larger ports, like Seattle, New Orleans, Galveston, Mobile, Savannah, Norfolk, Baltimore, Boston, and Portland (Maine), the establishment of sufficiently spacious immigration hospitals would very materially add to the administrative efficiency of the United States immigration laws and regulations.

Aliens inspected and certified at all ports and places in the United States and its dependencies and in Canada.

	Aliens certified. ¹		Important diseases for which certification was made. ¹											
	Class A.		Total.	Tuberculosis.	Insanity.	Idiocy.	Imbecility.	Epilepsy.	Feeble-minded and psychopathic inferiority.	Favus.	Syphilis.	Soft chancre.	Gonorrhea.	
	(1) Idiocy, imbecility, feeble-minded, insanity, epilepsy, and tuberculosis.	(2) Loathsome, contagious or dangerous conditions.												Class B: Dis- ease or defect which affects ability to earn living.	Class C: Dis- ease or defect of less degree.
Alo, Ariz.....	80	1	3											
Baltimore, Md.....	35,328	3	987	1				2			145	130	242	
Bellingham, Wash.....	33		1											
Biscayne Bay (Fla.) quarantine.....	9,448													
Blaine, Wash.....	103	6	50		5				4		1		3	
Boston, Mass.....	95,976	12	4,257	2	3		1	1	5		24	24	89	
Brownsville, Tex.....	8,223	13	364	77	6			2	5		5	2	4	
Brunswick, Ga.....														
Buffalo, N. Y.....	11,429	24	467		5	6		3	4				1	
Calais, Me.....	182		14											
Calcutta, Calif.....	2,976	2	15	1							1	7	10	
Charleston, S. C.....	3,912	2	31	2	2								15	
Columbia River (Oreg.) quarantine.....														
Del Rio, Tex.....	4,598	6	10								2		4	
Detroit, Mich.....	2,855		14											
Douglas, Ariz.....	3,028	53	323	10	7		1		27		4		27	
Duluth, Minn.....	2,323	20	21	20										
Duluth, Minn.....	7,638	2	46						1					
Esle Pass, Tex.....	15,616	9	35	1	1		1		4		2		1	
Esposito, Idaho.....	2,311	1	69	1	3								1	
El Paso, Tex.....	24,420	4	81		1									
El Paso, Tex.....		36	368		1	3		1		4	14		16	
Fall River, Mass.....	607		1										1	
Freeport, Tex.....	1,150	1	3											
Galveston, Tex.....	26,882	3	602	53	2	1		1			1	55	111	
Gloucester, Mass.....	511	2	27										1	
Hallifax, Nova Scotia.....	4,729	3	133		1	1		1			1	3	1	
Hidalgo, Tex.....	17,765	79	62											
Honolulu, Hawaii.....	3,914	12	95	10							1			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Houlton, Me.	44	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
International Falls, Minn.	281	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Jacksonville, Fla.	3,703	1	14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ketchikan, Alaska.	1,421	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Key West, Fla.	46,352	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Laredo, Tex.	23,971	10	119	8	179	171	1	1	1	1	1	1	1	1	1	1	1	1
Lewiston, N. Y.	11,372	2	3	2	39	5	1	1	1	1	1	1	1	1	1	1	1	1
Los Angeles, Calif. (San Pedro).	7,735	3	1	1	38	23	65	1	1	1	1	1	1	1	1	1	1	1
Marcus, Wash.	7,304	3	1	1	76	43	286	1	1	1	1	1	1	1	1	1	1	1
Mobile (Ala.) quarantine.	17,515	94	69	160	611	295	1	1	1	1	1	1	1	1	1	1	1	1
Montreal, Canada.	2,038	1	1	1	611	295	1	1	1	1	1	1	1	1	1	1	1	1
Naco, Ariz.	68,006	5	266	41	83	395	29	2	2	2	2	2	2	2	2	2	2	2
New Orleans (City) quarantine.	35,966	6	256	3	611	295	1	1	1	1	1	1	1	1	1	1	1	1
New Orleans (La.) quarantine.	1,023,791	264	1,468	20,084	4,662	26,478	333	54	66	19	49	11	33	3	3	3	3	3
Newport News, Va.	3,331	11	1	158	71	240	268	3	3	3	3	3	3	3	3	3	3	3
Newport, Vt.	1,023,791	264	1,468	20,084	4,662	26,478	333	54	66	19	49	11	33	3	3	3	3	3
New York, N. Y.	3,331	11	1	158	71	240	268	3	3	3	3	3	3	3	3	3	3	3
Niagara Falls, N. Y.	3,331	11	1	158	71	240	268	3	3	3	3	3	3	3	3	3	3	3
Norales, Ariz.	26,076	10	7	100	64	181	3	4	4	2	2	2	2	2	2	2	2	2
Norfolk, Va.	79,824	28	1,730	362	120	131	24	2	2	2	2	2	2	2	2	2	2	2
Norfolk, Va.	627	1	4	34	15	53	14	1	1	1	1	1	1	1	1	1	1	1
Ogdensburg, N. Y.	156	1	1	7	6	13	2	1	1	1	1	1	1	1	1	1	1	1
Oroville, Wash.	188	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pascagoula, Miss.	3,276	64	33	25	122	2	2	2	2	2	2	2	2	2	2	2	2	2
Perth Amboy, N. J.	63,493	1	3	3	7	1	1	1	1	1	1	1	1	1	1	1	1	1
Philadelphia, Pa.	8,524	17	465	70	1,131	25	5	2	2	2	2	2	2	2	2	2	2	2
Philippine Islands.	123	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Port Angeles, Wash.	552	7	2	83	3	95	1	2	2	2	2	2	2	2	2	2	2	2
Port Arthur, Tex.	2,812	8	142	41	61	232	4	5	2	2	2	2	2	2	2	2	2	2
Port Huron, Mich.	1,860	33	5	131	64	233	4	4	10	2	2	2	2	2	2	2	2	2
Portland (Me.) quarantine.	9,901	3	14	9	39	65	2	2	2	2	2	2	2	2	2	2	2	2
Portland, Oreg.	46	1	1	7	17	29	1	1	1	1	1	1	1	1	1	1	1	1
Porto Rico (other than San Juan)	5,325	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Port Tampa.	2,975	1	1	12	2	52	2	2	2	2	2	2	2	2	2	2	2	2
Port Townsend, Wash.	7,827	2	37	141	64	244	26	1	1	1	1	1	1	1	1	1	1	1
Providence, R. I.	17,296	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Presidio, Tex.	6,535	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Quebec, Canada.	13,145	2	50	165	11	228	12	1	1	1	1	1	1	1	1	1	1	1
Rio Grande City, Tex.	247	1	1	3	1	13	1	2	2	2	2	2	2	2	2	2	2	2
Sabine, Tex.	20,094	2	127	9	3	1	1	1	1	1	1	1	1	1	1	1	1	1
St. Albans, Vt.	348	14	4	25	16	54	1	1	1	1	1	1	1	1	1	1	1	1
St. Johns, New Brunswick.	12,476	9	9	324	127	474	1	4	3	1	1	1	1	1	1	1	1	1
St. Thomas, V. I.	1,999	11	6	2	2	17	9	1	1	1	1	1	1	1	1	1	1	1
San Diego, Calif.	3,274	1	1	2	2	9	3	1	1	1	1	1	1	1	1	1	1	1
San Francisco, Calif.	198	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
San Juan, P. R.	61,577	8	262	221	154	645	108	2	4	4	4	4	4	4	4	4	4	4
Sault Ste. Marie, Mich.	29,713	3	12	52	67	67	67	2	1	1	1	1	1	1	1	1	1	1
Savannah, Ga.	1,518	8	2	2	124	137	4	6	2	2	2	2	2	2	2	2	2	2
Seattle, Wash.	5,293	56	41	763	4	97	4	10	3	3	3	3	3	3	3	3	3	3
Seattle, Wash.	12,409	7	31	31	801	10	10	3	3	3	3	3	3	3	3	3	3	3

1 Includes alien seamen.

Aliens inspected and certified at all ports and places in the United States and its dependencies and in Canada.—Continued.

Aliens certified.					Important diseases for which certification was made.											
Number of aliens examined.	Class A.		Class B: Dis- ease or defect which affects ability to earn living.	Class C: Dis- ease or defect of less degree.	Total.	Tuber- culosis.	In- sanity.	Idiocy.	Imbe- cility.	Epi- lepsy.	Feeble- minded and psycho- pathic in-feri- ority.	Favus.	Syph- ilis.	Soft chan- cere.	Gonor- rhea.	
	(1) Idiocy, imbe- cility, feeble, minded, insan- ity, epi- lepsy, and tuber- culosis.	(2) Loath- some, con- tagi- ous or dan- gerous to living.														
Sumas, Wash.....	4	3	11	3	21	1	2	1			1					2
Sweetgrass, Mont.....	3		74	91	168		1	1			1					
Tacoma, Wash.....		8	1		9	2							5			1
Tampa Bay (Fla.) quarantine.....																
Tia Juana, Calif.....	1,337															
Tucson, Ariz.....	2	2	1	2	5											
Van Buren, Mo.....	7	99	5	1	111	46	1	5		1			36	2		15
Vancouver, British Columbia.....	84		5		7											
Victoria, British Columbia.....	4,012	19	145	21	207	6	8	2			1		3			9
Winnipeg, Canada.....	6,098	9	16	33	58			2		2						
Winnipeg, Canada.....	8,113	42	15	30	1,194	5	27	4	2	5	3		3			1
Yarmouth, Nova Scotia.....	29,611	1	12	72	85					1						
Total.....	822	7,165	30,143	8,740	46,870	1,331	237	171	22	61	51	231	133	906	1,319	2,415

Alien seamen inspected and certified.¹

	Inspected.	Certified.	Important diseases for which certification was made.										
			Trachoma.	Tuberculosis.	Insanity.	Idiocy.	Imbecility.	Epilepsy.	Feeble-minded.	Favus.	Syphilis.	Soft Chancre.	Gonorrhea.
Baltimore, Md.....	35,084	982	...	1	...	...	...	2	...	...	145	130	242
Boston, Mass.....	42,001	487	55	1	1	...	...	...	...	...	20	22	74
Galveston, Tex.....	26,571	595	53	2	1	1	...	...	...	...	32	55	110
New Orleans, La.....	69,807	409	28	5	2	...	...	...	...	...	5	151	100
Newport News and Norfolk (quarantine).....	104,608	2,317	120	25	3	...	...	3	3	...	227	415	909
New York.....	358,790	405	9	2	3	...	...	...	1	...	96	102	165
Philadelphia, Pa.....	39,485	637	6	2	1	...	...	1	...	...	10	205	150
San Francisco, Calif.....	40,350	36	10	...	...	...	...	...	...	...	1	7	8
Total.....	716,698	5,868	281	38	11	...	...	6	4	...	817	1,087	1,758

¹ Statistics are given only for the larger seaport stations.

BALTIMORE, MD.

Acting Asst. Surg. W. H. Hoak reports as follows:

One thousand five hundred and seven vessels, subject to immigration inspection, arrived at this port during the year, with a total of 244 alien passengers, who were subjected to medical examination. Thirty-five thousand and eighty-four alien seamen were also examined. In addition to this number, 249 stowaways were examined.

There were 1,013 medical certificates issued during the year for diseases and physical defects as follows:

ALIEN PASSENGERS.

Class B.—Diseases or defects affecting ability to earn a living:

Conjunctivitis, acute.....	1
Scoliosis (kyphosis).....	1
Sarcoma of leg (tibia).....	1
Valvular disease of heart.....	1
Wound of abdomen.....	1

ALIEN SEAMEN.

Class A.—Dangerous or loathsome contagious diseases:

Epilepsy.....	2
Tuberculosis.....	1
Tinea sycosis.....	1
Chancroid.....	130
Gonorrhea.....	242
Syphilis.....	145

Class B.—Diseases or defects affecting ability to earn a living, 461.

STOWAWAYS.

Class A.—Dangerous or loathsome contagious diseases:

Chancroid.....	4
Gonorrhea.....	11
Syphilis.....	4

Class B.—Diseases or defects affecting ability to earn a living:

Hernia	1
Loss of forearm	1
Ptosis of eyelids	1
Scabies, Norwegian	2
Loss of sight, one eye	1
Abscess of back	1

Aliens employed on American vessels and certified as suffering from dangerous or loathsome contagious diseases were required to be treated in hospital, as follows:

Tuberculosis	1
Chancroid	57
Gonorrhea	101
Syphilis	76

Alien seamen employed on foreign vessels and certified as suffering from dangerous or loathsome contagious diseases were required to be treated in hospital, as follows:

Chancroid	71
Gonorrhea	98
Syphilis	107

Prior to the act approved December 26, 1920, "To provide for the treatment in hospital of diseased alien seamen," and owing to the short time in port, and the inability of effecting a cure within a reasonable time, and with the approval of the Commissioner of Immigration, alien seamen employed on foreign vessels, certified as suffering from dangerous or loathsome contagious diseases were ordered detained and treated aboard their respective vessels, as follows:

Epilepsy	2
Chancroid	5
Gonorrhea	11
Syphilis	10
Tinea sycosis	1

In accordance with the provisions of the aforementioned act approved December 26, 1920, alien seamen as certified were hospitalized and inspections made weekly and oftener when necessary, to determine whether or not they had fully recovered.

BOSTON, MASS.

Acting Asst. Surg. A. J. Nute, in charge, reports as follows:

During the fiscal year ending June 30, 1921, 1,215 vessels arrived at the port of Boston from foreign ports, of which 759 were inspected under the immigration laws; 53,975 alien passengers and 42,001 seamen were inspected. Medical certificates were issued against 3,770 passengers and 487 seamen.

	Vessels.	Passengers.	Seamen.
1920	691	17, 147	32, 297
1921	759	53, 975	42, 001

In spite of existing handicaps immigration increased steadily, at times in a disconcertingly irregular manner. The old established

lines have not placed any new boats in service. The entrance of the United Mail and the United American Steamship lines brought many passengers from Naples, Danzig, Bremen, and Hamburg, in addition to the regular traffic.

The general physical condition of arriving aliens showed wide variation. Many seemed to be in better physical condition than in prewar days. Admitting that the passenger carriers for many years have not had the selective privilege that has existed since the armistice may account for this. If true it is puzzling to account for the number of seriously diseased and mentally defective aliens allowed to embark. Since February 1 a number of ships have been diverted from New York, thus adding to the already vexing problem of how to handle more with the limited personnel and facilities.

Very little first-class traffic entered Boston. On several occasions the character of passengers listed as first class developed a problem on account of the large number who, for reasons best known to themselves, elected to travel in the saloon rather than in their more natural sphere, the steerage. This class of passengers had to be inspected on board ship. The number of certificates indicated the necessity of careful scrutiny. With the limited facilities available, it required diplomacy to avoid any seemingly undue annoyance to regular saloon passengers in the confusion incident to landing.

Second class, on the large steerage boats, were inspected on the dock as in previous years. The system worked well, although it was difficult at times to overcome the tradition in the minds of some officials that having paid a cabin fare such passengers were entitled to special privileges.

With the establishment of the immigration station in East Boston, a number of conditions arose to impair the efficiency of crew inspection. The geographical location of the building, lack of prompt information of arriving vessels, and comparatively poor transportation facilities cause irritating delays in boarding vessels. Boarding ships by street car routes when the small gasoline launch employed for the purpose is not available is an expensive method from the standpoint of personal expenditure and time consumed. There has been a gradual improvement in the venereal incidence since the seamen's law went into effect. The larger foreign steamship companies generally have the men examined prior to signing articles, have a better class of men to select from, and most of those found to be diseased upon arrival have been willing to have treatment. The number of trachoma cases has recently increased over previous years, particularly among Chinese and East Indians, and it would be good policy if the seamen's law provided the same penalty for freight boats as applies to passenger vessels. Limitation of hospital space has been a problem, but fortunately room was made for the number infected by the co-operation of some of the city institutions. If the number continues to increase as it did in the past month, some other provision will have to be made.

The problem of obtaining reliable information relative to incoming ships has not been satisfactorily worked out, although a number of methods have been tried. The establishment of a boarding division in connection with the Customs Service in the city proper is contemplated as one way of meeting this deficiency.

Under the new law, with its limited quota, the crew inspection will be more important than ever, for it is a loophole by which many can easily enter the country. Medical officers have inspected vessels at the subports of Plymouth, Lynn, Fall River, and Weymouth, Mass., New London and Norwalk, Conn.

The low cost of hospital care at this port made it unwise for the Government to consider maintaining an immigrant hospital. This year the general per diem rate varied from \$2 to \$2.75 according to the type of hospital. The main disadvantage has been the location of the immigration station. All sick have to be conveyed to the city proper by way of ferryboats, and the time consumed varies from one to three hours, provided an ambulance or other conveyance is available. The only hospital available in East Boston is an emergency relief branch of the Boston City Hospital.

Five hundred and ninety-eight aliens were admitted to various hospitals and of these 15 died. Causes of death were, pneumonia 5, cerebrospinal meningitis 3, scarlet fever 2, hemorrhage of the lung 1, heart disease and pulmonary edema 1, measles 1, erysipelas 1, uremia 1.

The Carney and Haynes Memorial Hospitals extended every facility and often inconvenienced themselves to handle unusual numbers.

In regard to the immigration station. As mentioned in previous report, adequate facilities for cleansing and delousing arriving immigrants and keeping them clean should be installed and provision made to see that they are used. All persons found infected with pediculi and scabies were referred for proper treatment. There are no facilities in the building for segregating the diseased—physically, mentally or morally—from the well, and overcrowding at times has been a menace. City of Boston regulations require 400 cubic feet of air space for each person in a municipal lodging-house dormitory.

It was noticeable that when the station was filled to anything like physical capacity that pneumonia, sore throat, influenza, mumps, and various children's diseases promptly began to appear. Fortunately, measures taken rapidly controlled the situation before it could be said to have assumed epidemic proportions. Outdoor exercise and indoor occupation should be provided in order to keep the inmates in better physical and mental condition.

The medical aspects of immigration work has been recognized and detailed examinations are being developed more thoroughly as facilities permit. For the year ending June 30, 1914, 80,332 passengers arrived and 4,558 certificates were issued, while this year, in contrast, 53,975 passengers arrived and 3,770 certificates were issued. The delousing work performed at the quarantine station has been of valuable assistance in keeping down the amount of vermin in the station.

One hundred and seventy-nine stowaways were inspected, and of this number 42 were found to be diseased. It is possible that some stowaways escaped apprehension, and it is probable that under the new act stowaway traffic will tend to increase.

It is of interest that 184 certificates for various degrees of defective vision that might handicap a person in the industrial world were issued. It is believed that if all inspectors carefully observed aliens struggling over the reading test more might be detected by referring such cases back to the medical department for eye exami-

nation. It was necessary to hold a number of cases of inflamed scalp under observation for a longer period than usual, because while the alien claimed it was part of the delousing process or due to some injury received on board ship, evidence of epilation and medication were found that aroused suspicion that other things besides lice and their eggs had been treated prior to embarkation.

Considerable work has been done in the way of reexamining aliens certified at various ports, admitted on bond, or who were or had been in hospitals and institutions. Practically every case certified here under class A has been contested to the limit of the immigration law by relatives, friends, and various other interested persons.

GLOUCESTER CITY, N. J.

Surg. D. E. Robinson reports as follows:

Immigration at the port of Philadelphia showed a marked increase over year preceding, 24,010 alien passengers having been inspected as against 4,381 for the year ended June 30, 1920. The increase was due in part to the congestion at the port of New York, several vessels originally destined to that port having been diverted to Philadelphia.

The immigration was of an excellent character during the first six months, but deteriorated greatly toward the close of the year. This has necessitated a more rigid examination of the aliens and, while the primary inspection must be done at the docks, arrangements have been completed whereby a more thorough examination, possible only after a partial disrobing, can be carried out in a larger percentage of cases.

Four hundred and ninety-four certificates were rendered for diseases and disabilities found among alien passengers, 13 of the certificates being for conditions falling under class A (I) and 38 under class A (II).

The examination of alien members of crews continued to furnish a large part of the work here. During the year 1,311 vessels were boarded. These vessels carried crews totaling 50,431, of which number 39,485 were aliens and subject to examination. Certificates to the number of 636 were rendered for conditions found among alien crews, the greater part (421) being for venereal diseases, although the percentage of venereal infection is gradually decreasing owing to the greater care taken to prevent the signing on of those already showing evidences of infection. The hospitalization of the venereally infected continued to be enforced.

MONTREAL, CANADA.

Surg. M. K. Gwyn, in charge, reports as follows:

During the fiscal year ending June 30, 1921, 17,615 aliens were examined, of whom 1,069 aliens were certified for various mental and physical defects.

The more important certifications were as follows: Class A-1, 94, of whom 94 were refused admission to the United States. Class A-2, 69, all of whom were refused admission to the United States.

Although there were 1,400 less persons examined, the number of important certificates was materially increased over the previous fiscal year. The number of insane persons detected was doubled.

In addition to the above 6,829 alien Chinese in transit through Montreal were examined.

The appointment of an additional part-time medical inspector has been justified, as shown by the increase in the number of the more important diagnoses which were made, especially the cases of mental and nervous defects detected.

To properly enforce the medical inspection contemplated by the immigration act, it is essential to have quiet examining rooms where the insane and mentally defective may be examined free from annoying interruptions, which tend to distract the alien and render his examination more difficult. The detection of insanity is at all times a difficult thing, and the conditions under which the examination is carried out should be made as helpful as possible.

The conditions under which aliens were examined remain the same as last year, and nothing has been done to make their stay in the office a little more comfortable. There is the same lack of toilet facilities for the women and children, the same lack of drinking water during the hot weather, as prevailed during the last fiscal year.

NEW ORLEANS, LA.

Acting Asst. Surg. J. T. Scott reports as follows:

The very considerable increase in cases under treatment at the local immigration station was a decided offset to the small number of aliens, immigrant and nonimmigrant, arriving at New Orleans within the past 12 months. An immigrant vessel proper has not arrived since before the World War.

The work at the immigration station is done under difficulty, as has been mentioned before, and that condition continues with little improvement. Sleeping quarters are crowded and not altogether sanitary, with little or no chance of properly separating and isolating cases of tuberculosis, syphilis, gonorrhea, chancroid, trachoma, malaria, etc., one from another. Complaints of these conditions are often heard from the outside as well as from the inmates. Immigration officials say they are without funds to remedy the situation by erecting new buildings or enlarging the present ones.

There has been a slight improvement in the supply of drugs, surgical dressings and other supplies, owing to frequent demands for them and complaint about the inadequate supplies heretofore. There has been a great increase in the number of cases sent from quarantine for further medical observation as well as treatment, particularly venereal cases. The majority of those sent are not beneficiaries of the Public Health Service, hence are sent to the immigration station for observation and treatment, as the case may be. The cases requiring treatment are detained until cured or sufficiently improved to be returned to their ship.

A great many cases are sent from quarantine as suspicious of trachoma, but are found to be simple cases of hyperemia of conjunctiva, due to effects of heat, fumes, and grit from furnaces, also cases of blepharitis conjunctivitis acute and chronic follicular and catarrhal. These have to be held, in some cases, and treated before

a definite diagnosis can be arrived at. These cases require a great deal of attention from the medical officer with only the untrained, but willing, assistance of the matron. The matron is not a trained nurse.

Owing to the great increase in the number of cases being sent to this station it is urgently suggested that one or more trained nurses be assigned here. The daily administration of arsphenamine makes it all the more necessary that trained assistance be on hand day and night because of the severe reaction following this drug in many cases. All cases of syphilis are given a thorough course of arsphenamine before being released to rejoin their vessels. These cases are treated by the medical officer and then turned over to the matron, who looks after them until they are seen again on the following morning—a risky as well as unsatisfactory way of handling these cases. The maintaining of a fair size hospital without trained nurses makes the handling of these cases difficult to all concerned and the end results unsatisfactorily.

Transportation difficulties are as great or greater than heretofore. The medical officer has to depend upon automobile transportation owing to the unsatisfactory street car service, strikes, and out of the way location of the immigration station. Quite a few detained aliens are sent to various local institutions for treatment from time to time and get medical attention when required.

NEW YORK.

Surg. J. W. Kerr, in charge, reports as follows:

During the fiscal year 1921 passengers and crews arriving at New York from foreign ports were as follows:

Alien passengers	665,001
Crew, aliens	358,790
Grand total, aliens	1,023,791

The above represents an increase of almost 50 per cent of alien passengers over those arriving the previous year, the numbers in the respective years being 333,727 in 1920, and, as above stated, 665,001 in 1921. There was likewise an increase, though slight, among alien crews this year as compared with the fiscal year 1920. The above passengers and members of crews were subjects for examination on arrival.

These examinations and other medical activities of the service at Ellis Island are conducted through divisions, viz: (a) Boarding, (b) examination, (c) hospital.

BOARDING DIVISION.

The examination of cabin passengers was made through the year aboard ships. In one or two instances during the winter months examinations of steerage passengers were also attempted aboard ships in order to lessen the congestion in the port, but this practice was advised against and discontinued on account of lack of facilities aboard and the inability to do thorough work under the conditions which prevailed. Not only should all steerage passengers be removed to Ellis Island for medical examination but second cabin as well,

especially since the enactment of the law of June 3, 1921, further limiting the number of aliens that may come.

Members of crews were necessarily examined on board ship. The total numbers examined and certified as being afflicted with mental or physical defect as well as other statistical data are presented later on in report.

The law of December 26, 1920, provides for treatment at the expense of the vessel of alien seamen afflicted with any of the disabilities or diseases mentioned in section 35 of the immigration act of July 5, 1917. These cases, including insanity, epilepsy, tuberculosis or a loathsome or dangerous contagious disease are accordingly referred to hospital.

The majority of all diseases detected among seamen are venereal. When there is a ship's surgeon aboard it would be much more humane and just to the afflicted seaman, where practicable, to certify him and allow him to continue aboard under surveillance and treatment of his surgeon. In those cases where the seaman or those coming in contact with him might be endangered his temporary removal to hospital would of course be indicated.

As a means of increasing the efficiency of the medical inspection of seamen and facilitating the commerce of the port arrangements were made with the Commissioner of Immigration and the medical officer of the service in charge of the quarantine station to conduct both the medical examination and the immigration inspection of crews on all nonpassenger carrying vessels in conjunction with the quarantine inspection. This was begun June 4, 1921. For the purpose a special vessel was set aside at the quarantine station to serve this class of vessels and two medical officers were detailed from the staff of the chief medical officer at Ellis Island to supplement the boarding staff at the quarantine station. The Commissioner of Immigration likewise detailed several inspectors to board these vessels, the inspections being completed before they leave the quarantine anchorage. In time the combined inspection of all alien members of crews should be made at the quarantine station.

All vessels entering the port through Long Island Sound during the year have been boarded and inspected medically both from immigration and quarantine standpoints at the City Island substation, an officer being stationed there for the purpose.

EXAMINATION DIVISION.

As previously stated, all steerage passengers are brought to Ellis Island for examination. Cabin passengers and members of crews held for further medical observation are likewise transferred to Ellis Island where they are then carefully examined and either certified, passed, or remanded to hospital.

Within the year the physical and mental types have not been as good as in previous years nor as good as at the beginning of the present year. Furthermore, with one or two exceptions all steamship lines are carrying passengers gathered from all over Europe and western Asia. It is difficult to see how these diverse ethnologic groups can be assimilated, and the effect they will have on the physical and mental development of the future citizens is problematical.

Recognizing the menace of vermin infestation of passengers coming from Europe during the past winter, special inspections were made to determine its degree and to protect those in detention at Ellis Island. These inspections were made while passengers were partially disrobed and undergoing physical examinations. Over one-third of all steerage passengers arriving during the last seven months of the year were thus gone over.

A representative member from every ship was deliberately examined, the seams of their clothing inspected to detect lice and nits, and visual inspections made for evidences of venereal diseases and other disabilities contemplated under the immigration law.

On the discovery of vermin infestation in any degree this fact was reported to the Commissioner of Immigration. In the majority of ships the infected passengers were returned to the ship, unless there were only a few, in which case they were sent to hospital for disinfection. On some ships infected passengers were returned as many as four times by the commissioner.

As showing the value of deliberate examinations over line inspections for the detecting of mental and physical disabilities the following figures are presented, they relate to passengers examined between February 13, 1921, and June 30, 1921:

Number examined.	Immediately certified.		Referred to hospital.	
	Number.	Percentage.	Number.	Percentage.
Primary and secondary line inspections (98,370)	4,800	4.879	1,713	1.741
Deliberate (42,319)	3,360	7.939	2,018	4.769

By the latter method over five times as many lung cases were sent to hospital for final diagnosis, and ten times as many valvular diseases of the heart were detected and certified.

The medical staff has been adequate to make as many deliberate examinations as the examination space and other facilities would permit. Recommendations have been made to the Commissioner of Immigration to increase these facilities whereby all aliens passing through Ellis Island may be deliberately examined (partially disrobed, in private rooms). With the reduction of the volume of immigration it should be practicable to thus deliberately examine steerage passengers. It is believed the method and results obtained would approximate those of the examinations for the draft. The mental examinations will always be surrounded by inherent difficulties on account of diversity of languages, social customs, etc., but these examinations may in time be further standardized.

In addition to examinations of incoming passengers made aboard ship and at Ellis Island over 850 warrant cases were examined, and officers were detailed during the year to visit and examine 46 additional warrant cases or cases in State institutions at various places in and around New York.

Officers of the examination division are required in turn to serve as officer of the day and make inspections of passengers in detention in the immigrant rooms. These officers also treat any passengers or

employees who may be suffering from minor ills. From July 1, 1920, to June 30, 1921, the numbers so treated were as follows:

Aliens.....	3,845
Employees.....	264
	4,109

During daily inspections May 17, 1921, a suspected case of typhus fever was taken out of one of the temporary detention rooms and sent to hospital. He developed a definite typhus rash on the third day of illness, and examination of his blood gave a positive Felix-Weil reaction. As he had slept in separate barracks at night, which was occupied by a large number of aliens, all aliens who could possibly have come in contact with him, or have been the source of infection, were sent to the quarantine station, Hoffman Island. The patient died on the fifth day of illness, but no further cases occurred either at Ellis Island or Hoffman Island among those detained. In this single case it was not possible to trace the infection.

On account of the danger of the introduction of typhus fever from Europe, a careful watch was constantly kept during the winter and spring to detect cases among arrivals at Ellis Island and those in detention.

HOSPITAL DIVISION.

The hospitals were operated during the year by the Public Health Service under an interdepartmental arrangement referred to in the last annual report. On account of the character of arriving aliens, and the conditions of travel, a larger number of patients were admitted for observation and treatment than in any previous year.

At the beginning of the year and for some time thereafter, beneficiaries of the Public Health Service, including ex-soldiers and seamen, American seamen, and some Government employees were admitted and treated.

With the great increase in the number of alien patients it became necessary to limit and finally to discontinue the admission of beneficiaries.

The total number of patients admitted to hospital during the year were as follows:

Public Health Service beneficiaries.....	483
Aliens.....	15,723
Beneficiaries in hospital July 1, 1920.....	105
Aliens in hospital July 1, 1920.....	355
Grand total treated.....	16,666

Laboratory examinations.—The activities of the laboratory were more than doubled as compared with the previous year. The specimens examined were as follows:

Blood:	
Complement fixation, syphilis.....	3,879
Erythrocyte counts.....	11
Leucocyte counts.....	21
Differential leucocyte counts.....	22
Malaria.....	112
Blood cultures.....	121

Urine:	
Urinalyses—	
Routine	4, 015
Special	10
Quantitative sugar	16
Feces:	
Parasites and ova	96
Occult blood	12
Sputum:	
Tubercle bacillus	1, 072
Avery method	11
Mouse method	2
Stomach or duodenal contents:	
Special	4
Spinal fluid:	
Wassermann	43
Colloidal gold reaction	6
Globulin test	53
Cell count	53
Bacteriological examination	110
Bacteriological examinations:	
Pus	49
Exudates	55
Discharges	74
Urethral	3, 831
Palladium (dark field)	242
Throat smears—	
Diphtheria	42
Vincent's angina	40
Throat cultures—	
Routine	5, 184
Cultures	35
Typhoid and paratyphoid examinations:	
Agglutination tests	80
Feces	9
Water analyses:	
Bacteriological	43
Milk analyses:	
Chemical	34
Bacteriological	34
Animal inoculations:	
For diagnosis	3
Pathological examinations:	
Tissue examination, leprosy	13
Vaccines:	
Autogenous	5
Miscellaneous examinations:	
Ringworm and favus of scalp and nails	3, 481
Weil-Felix test	23
Total	22, 946

The volume of work and limited scientific personnel precluded the conduct of special studies for which there are abundant opportunities. Efforts were made throughout the year to secure a permanent scientific director for the laboratory, but without avail.

X-ray activities.—Extensive use of the X-rays was made both in diagnosis and treatment during the year. A summary of this work is embodied in the following tables:

Number of exposures	4, 285
Fluoroscopies	25
X-ray films, all sizes	3, 651
Dental films	377
Plates	245

Anatomical classification of cases examined:

Accessory sinuses.....	191
Bones and joints.....	858
Pulmonary.....	1, 133
Cardiovascular.....	28
Gastrointestinal.....	27
Head, scalp treatments.....	204
Foreign bodies.....	9
Teeth.....	54
Urinary tract.....	15
Miscellaneous.....	1

While under the immigration law favus and ringworm are mandatorially excludable diseases, under certain circumstances authorization for treatment may be granted by the Secretary of Labor. During the year 502 cases of favus and ringworm of the scalp and nails were detected and certified, being a larger number than was certified in any previous year. This number represents a rate of about 7.35 cases per thousand as compared with 2.98 per thousand in 1914, the last year of normal immigration. This is attributable undoubtedly to the character of immigrants arriving.

In consequence of the larger numbers of cases of favus and ringworm of the beard, nails, and scalp and the abnormal conditions of immigration, unprecedented numbers were treated under the authority above mentioned.

A total of 170 cases of favus and ringworm of the nails were treated in the hospital during the year, the treatment consisting in removal of the affected nails, and application of antiseptic dressings.

The following table gives a summary of the cases of favus and ringworm of the scalp and beard treated during the year, those of this number discharged recovered, those still in hospital, and those requiring a second treatment. The X-rays alone were used to effect epilation and parasitocides then applied.

Disease.	Total cases.	Recovered.	Remaining in hospital.	Second treatment.	Deported.	Died.
Favus.....	75	54	19	10	1	1
Ringworm.....	107	26	81	4		
Trichophytosis barbae.....	2	1	1			
Total.....	184	81	101	14	1	1

The measures taken for the detection of mycotic infection have undoubtedly greatly reduced the number of cases that would otherwise have entered the country. Since these diseases are known to spread slowly it is believed these precautions continued for many years have had a bearing on the decrease of their prevalence. As evidence of this the statistics collected by the American Dermatological Association may be cited. From 1878 to 1911, inclusive, cases of favus represented a percentage of 0.3 of all dermatosis reported by its members. For the years 1898 to 1911, inclusive, the percentage was 0.26, while for the year 1916 it was 0.16.

On account of the restrictions against favus and ringworm of the scalp at domestic ports, there has been a growing practice abroad of treating infected scalps with the X-rays to bring about epilation and then permitting the aliens to embark before a growth of hair has

occurred. Under these conditions it is impracticable to make a diagnosis, and these "baldheads" have had to be held pending such growth. On June 30, 1921, a total of 60 of such cases were on hand awaiting diagnosis.

The criteria on which to base a cure of favus or ringworm are most important from a governmental standpoint. Sabauaro states in respect to favus as follows:

After several negative microscopic examinations, and when the redness at the site of the old lesions has disappeared, a case of favus can be regarded as cured, but on condition that we continue to keep it under surveillance and on condition that the patient presents himself to the physician whenever he sees any abnormality whatsoever appear at the site of the old lesion.

Many eminent authorities consulted in this country are of the opinion that patients should be kept under observation for several weeks or months after the return of the hair, during which time numerous microscopic examinations must be made. The routine procedure at this hospital after the growth of hair has occurred is to apply three sweat caps at intervals, after which microscopic examinations are made. By these means only could failures in treatment be detected.

Diversity of diseases.—The diseases treated in hospital were very diverse in character, coming as they do from all parts of the world. Among seamen the bulk of the diseases were venereal. Among alien passengers there were many pulmonary affections and a large number of contagious diseases, including diphtheria, measles, meningitis, and scarlet fever. By reason of the conditions of travel and prolonged detentions aboard ship these last mentioned diseases were attended too often by severe complications. The pneumonias also were in many instances complicated by empyemas.

Reconstruction activities.—During the year one physio-therapy nurse was regularly engaged in giving treatments under instructions from the ward medical officers. The benefits of such treatments have been striking.

As stated in the last annual report, occupational therapy was introduced in the hospital. By reason of the character of patients its nature and scope have necessarily varied from other hospitals of the service. The purpose has been to maintain morale, to hasten recoveries, and incidentally to impart instruction as to the ideals of American life. Adult patients, properly selected, have been given handcraft to do. The work among children on the other hand has been developed along educational lines. Classes were formed, about 150 children composing them regularly. These children are taught to read and write English, to be courteous and respectful, to be patriotic, to sing national songs and salute the flag, and to observe the ordinary rules of hygiene. This work is conducted in the wards, the children being organized in small groups depending on the diseases from which they suffer. The work has been beneficial in accomplishing the objects mentioned, and relieve the nurses of the care of these children many hours a week.

Social service activities.—Through arrangements made by the bureau with the Red Cross the corps of regularly trained hospital workers have continued their activities throughout the year. These activities have included the following:

- (a) Daily visits of the service workers through the wards.

(b) Supervision of the recreation room during visiting hours, wherein all patients who are able to be up are permitted to see their friends.

(c) Preparation of daily reports containing information for the immigration authorities and others regarding the progress of patients in hospital and special reports relating to those seriously ill.

(d) Conduct of correspondence for patients who are too ill or unable to write.

(e) Arrangement for entertainments for patients and employees from time to time.

On account of its value this work has been assumed as an official activity of the hospital beginning July 1, 1921.

As in the previous year, the American Library Association operated a library for patients and distributed literature through the wards both in book and periodical form. These books and papers were in over 30 languages. Acknowledgment is here made of the usefulness of this service.

Hospital organization.—Though consisting of general and contagious hospitals, they are operated as a single unit, the organization being practically that of type A hospitals specified by regulation. In addition to the personnel, registration, matériel, and dietetic divisions, an information division is operated by the hospital service-workers. In the operation of the hospitals and general conduct of the medical inspections cordial cooperation has been had from the immigration officers and employees during the year. This spirit, so essential to efficient work, is here heartily acknowledged.

Report of medical certificates relating to alien passengers.

Class A (1), including 63 insane, 65 feeble-minded, 19 idiocy, 5 constitutional psychopathic inferiority, 49 imbecility, and 4 epilepsy, 1 mental defect, and 52 certified for tuberculosis	258
Class A (2), loathsome contagious diseases, including 324 trachoma, 80 syphilis, 28 chancroid, 137 gonorrhea, 1 leprosy, 1 frambesia, 111 favus, 28 trichophytosis barbae, 1 trichophytosis face, 166 trichophytosis tonsurans, 1 trichophytosis trunk, 218 trichophytosis of the unguitum	1,096
Class B, disease or defect which affects ability to earn a living	20,069
Class C, diseases or defects of less degree	4,650

Report of medical certificates relating to alien seamen.

Class A (1), including 3 insane, 1 feeble-minded, and 2 certified for tuberculosis	6
Class A (2), loathsome contagious diseases, including 9 trachoma, 96 syphilis, 102 chancroids, and 165 certified for gonorrhea	372
Class B, diseases or defects which affect ability to earn a living	15
Class C, diseases or defects of less degree	12

Disposition of immigrants certified.

Class A (1):	
Cases pending at beginning of year	12
Cases certified during year	258
Total to be accounted for	270
Cases deported	140
Cases landed	101
Cases pending close of year	29

Class A (2) :

Cases pending at beginning of year.....	43
Cases certified during year.....	1, 096
Total to be accounted for.....	1, 139
Cases deported.....	493
Cases landed.....	428
Cases pending close of year.....	218

Class B :

Cases pending beginning of year.....	139
Cases certified during year.....	20, 069
Total to be accounted for.....	20, 208
Cases deported.....	485
Cases landed.....	19, 551
Cases pending close of year.....	172

Class C :

Cases pending at beginning of year.....	11
Cases certified during year.....	4, 650
Total to be accounted for.....	4, 661
Cases deported.....	57
Cases landed.....	4, 565
Cases pending close of year.....	39

Race of aliens certified for mental condition during fiscal year ending June 30, 1921.

Race.	Insane.	Feeble-minded.	Imbecile.	Epilepsy.	Idiocy.	Constitutional psychopathic inferiority.	Mental defect.	Total.
African, black.....	1							1
Armenian.....		2						2
Belgium Flem.....				1				1
Bulgarian.....			1					1
Czecho-Slovak.....	1	1	4	1				7
Cuba.....			1					1
Denmark.....	1							1
English.....	6	2	4			1		13
French.....		1	1					2
Finnish.....	1							1
Greek.....	1	1	2					4
German.....		1						1
Hebrew.....	14	32	21		8		1	76
Holland, Dutch.....	1							1
Irish.....	6	4	1		1	2		14
Italy, North.....					1			1
Italy, South.....	16	15	9	1	5	2		48
Jugo-Slovak.....	1		1		1			3
Magyar.....	1	1						2
Lithuania.....	1							1
Norway.....	1							1
Polish.....	3	1	3	1				8
Russian.....		1			1			2
Ruthenian.....		1						1
Spanish.....	1				2			3
Scotch.....	4	2	1					7
Slovene.....	1							1
Syrian.....	1							1
Sweden.....	1							1
Total.....	63	65	49	4	19	5	1	206

Nativity and race of immigrants certified for trachoma during fiscal year ending June 30, 1921.

Nativity.	Arabian.	Armenian.	Croatian.	Finnish.	German.	Greek.	Hebrew.	Irish.	Italy, South.	Japanese.	Mongolian.	Magyar.	Maltese.	Polish.	Portuguese.	Rumanian.	Syrian.	Serbian.	Slovak.	Spanish.	Turk.	Total.
Arabia.....	1																					1
Armenia.....		4																				4
Austria.....			1		1																	2
Bohemia.....							1															1
China.....											6											6
Czecho-Slovakia.....												1							14			15
France.....				2													3					3
Finland.....							5															2
Greece.....																						5
Germany.....					2																	2
Italy.....									113													113
Jugo-Slovakia.....										1									9			9
Japan.....																						1
Malta.....												5										5
Poland.....					1		26							11								38
Portugal.....															3							3
Russia.....					1		3															4
Rumania.....							9									5						14
Serbia.....																	2					2
Spain.....																				34		34
Syria.....																	6					6
Turkey.....		36					5										6				3	50
United Kingdom.....								4														4
Total.....	1	40	1	2	5	5	44	4	113	1	6	1	5	11	3	5	15	2	23	34	3	324

Races of immigrants deported on medical certificates during fiscal year ending June 30, 1921.

Race.	Men.	Women.	Children.		Total.
			Male.	Female.	
African, black.....	29	4	1		345
Albanese.....	4	1	1		6
Armenian.....	13	5	5	3	26
Austrian.....	1				1
Arabian.....	1		1		1
British East Indian.....	1				1
Belgium.....	1				1
Bulgarian.....	1				1
Cuban.....		1		1	2
Croatian.....	1				1
Danish.....	2			1	3
English.....	30	12			44
Finnish.....	1	2	1		4
French.....	6	1	2		9
Dutch.....	2				2
Flemish.....	1				2
Greece.....	75	9	5	8	97
German.....	11	2	2		15
Hebrew.....	58	25	10	12	105
Italy, South.....	304	66	44	12	426
Italy, North.....	3	2			7
Irish.....	28	12	1	1	42
Jugo-Slovak.....	19	10	2	4	35
Japanese.....	1				1
Lithuanian.....	1	2			7
Mongolian.....	5		2		12
Maltese.....	11		1		16
Magyar.....	13	2		1	7
Norway.....	7				1
Mexico.....	1				16
Portuguese.....	13	2		1	17
Polish.....	6	5	2	4	11
Rumanian.....	7	3	1		1
Persia.....		1			3
Swiss.....	3				3
Serbia.....	1	1		1	3
Spanish-American.....	7				7

Races of immigrants deported on medical certificates, etc.—Continued.

Race.	Men.	Women.	Children.		Total.
			Male.	Female.	
Slovene.....	.....	1	.....	1	2
Syrian.....	9	1	1	2	13
Sweden.....	9	1	.....	.....	10
Spanish.....	98	6	14	.....	118
Slovak.....	11	17	6	.....	34
Scotch.....	11	3	1	1	16
Turkey.....	6	2	1	.....	9
Welsh.....	1	.....	.....	.....	1
Russian.....	1	.....	.....	.....	1
Total.....	814	200	110	51	1,175

Summary of hospital transactions.

Number of patients in hospital at the beginning of year.....	355
Number of patients admitted to hospital during year.....	¹² 15,723
Total treated (men, 6,890; women, 4,093; male children, 2,719; female children, 2,376).....	16,078
Births (male, 16; female, 14).....	30
Deaths (men, 59; women, 54; male children, 112; female children, 99).....	324
Pay patients treated during year.....	15,415
Free patients treated during year.....	663
Number of days treatment pay patients.....	179,789
Number of days treatment free patients.....	9,046
Total number of days treatment for hospital cases.....	188,835
Maximum number of patients in hospital at any time during year.....	726
Daily average number of patients in hospital.....	517
Number of patients in hospital at end of year.....	571

Hospital.	From previous year.	Admitted.	Total treated.	Recovered.	Improved.	Not improved.	Died.	Remaining.	Total treatment (days).
Aliens.....	355	15,723	16,078	7,981	3,951	3,251	324	571	188,835
Beneficiaries.....	105	483	588	172	358	47	8	3	13,565

NORFOLK, VA.

Acting Asst. Surg. Frank C. Makepeace, in charge, reports as follows:

During the fiscal year ended June 30, 1921, there were examined 78,642 seamen for the purpose of detecting disease and physical and mental defects in accordance with the provision of the United States immigration laws.

The total number of alien seamen certified was 2,049. Of the seamen found defective there were 24 certified for tuberculosis, 1,665 as being afflicted with either loathsome contagious or dangerous contagious diseases (chiefly venereal diseases), and 356 for conditions that may affect their ability to earn a living. It should be especially noted that of the alien seamen examined there were detected 787 cases of gonorrhea, 356 cases of soft chancre, and 201 cases of syphilis.

All alien seamen arriving at this port have been thoroughly examined for evidence of venereal disease. All persons presenting

¹² 483 beneficiaries not included in this statement.

suspicious lesions were brought to the station proper and the diagnosis confirmed by the usual laboratory procedures.

Throughout the year 1,243 alien seamen who were found on inspection to be suffering from dangerous contagious diseases were sent to hospitals in the city for treatment. The conditions requiring such hospital isolation were discharged as recovered, others as no longer infectious, and on account of lack of hospital space a great many other diseased seamen were allowed to sail foreign under special provisions to prevent the dissemination of their disease during return trip.

PORT HURON, MICH.

Acting Asst. Surg. George M. Kesl reports as follows:

During the year ending June 30, 1921, there was a gradual return to normal conditions of travel and the approximate number of passengers entering the United States through the district over which the United States Immigration Service with offices in Port Huron has jurisdiction was about 680,000. This district extends from Algonac, Mich., on the south to North Port Huron, Mich., located at the southern extremity of Lake Huron, a distance of 31 miles. Sub-offices of the Immigration Service are maintained at Algonac, Roberts Landing, Marine City, St. Clair, at the dock of the Port Huron & Sarnia Ferry Co. in Port Huron and at the dock of the North Port Huron & Point Edward Ferry in North Port Huron and the main office is located at Port Huron Tunnel Station of the Grand Trunk Railway near the western city limits of Port Huron. During the year 1,766 alien passengers were referred to this office for physical examination, 229 of whom were certified as having a physical or mental defect and 62 so certified refused admission into the United States.

At the request of the inspector in charge, United States Immigration Service, this port, there were 94 alien seamen examined of whom 4 were certified for physical defect or disease. These examinations were made with the view of not interfering with shipping and with as little delay as possible, in one instance an officer of the service being sent to Point Edward, Ontario, in order to examine crews of two vessels docked at that point.

Nineteen visits were made by medical officers to the St. Clair County jail and city detention home to examine or treat aliens under detention at those places pending deportation or the application of warrants for same.

SANITARY REPORTS AND STATISTICS.

During the fiscal year ended June 30, 1921, the country did not experience any widespread epidemic of disease which created excitement, and, in general, health conditions in the United States were good as compared with past years, but the marked increase in the number of cases of smallpox and the failure to reduce the number of cases of diphtheria and the deaths from this disease indicate that the well-known means for the prevention of these diseases were not used as generally as might have been expected.

STATISTICAL OFFICE.

As outlined in the Annual Report of the Surgeon General for the fiscal year 1920, the purposes for which the Statistical Office was established are:

(1) To provide a central plant, with experienced personnel and necessary mechanical equipment, for the tabulation of material collected in previous studies and reports of disease prevalence.

(2) To furnish, in connection with many other lines of service activities, the technical advice required in planning their statistical work and in the analysis of the results of such work.

(3) To conduct certain statistical studies independently but closely coordinated with other field and epidemiological studies carried on by the Public Health Service.

The statistical office has been under the charge of Statistician Edgar Sydenstricker, with Prof. Raymond Pearl, head of the department of biometry and vital statistics, School of Public Health, Johns Hopkins University, and Dr. W. I. King, statistician and economist of the research staff, National Bureau of Economic Research, as consultants in epidemiology and statistics. A force varying from 5 to 15 clerks has been employed during the year, and mechanical equipment has been provided, consisting of counting-sorting, tabulating, card punching, computing, calculating, and graphing machines and devices. In addition to this personnel, there have been either detailed to or working in close cooperation with this office on statistical phases of various studies assistant statisticians from the Office of Industrial Hygiene and Sanitation, the Office of Child Hygiene, and the Office of Field Investigations of Pellagra, and a varying number of clerical workers from these offices and from the Division of Venereal Diseases. The organization of this entire personnel is such that it functions more or less as a single unit, according to the immediate demands of the work in progress.

I. ASSISTANCE IN MECHANICAL TABULATION.

The mechanical and clerical equipment of the Statistical Office was used not only for the studies carried on more or less independently by the Statistical Office, but also for other offices and divisions in the Public Health Service. Assistance was given in the mechanical tabulation of data to the field investigations of child hygiene and field investigations of pellagra, field investigations of influenza, the Hygienic Laboratory and to the Division of Venereal Diseases.

II. ASSISTANCE GIVEN IN THE PLANNING AND THE ANALYSIS OF RESULTS OF VARIOUS FIELD STUDIES.

Upon request, the Statistical Office has furnished from time to time to various other offices and divisions of the Public Health Service technical advice in the planning of statistical work and the analysis of results. Such assistance has been given to the Division of Venereal Diseases, to various offices conducting field investigations, the Hygienic Laboratory, and to the statistical section of the Marine Hospital Division. It has also been called upon to assist in the planning of records and in the statistical use of the records of the Bureau of War Risk Insurance, and on various committees of a semiofficial character, such as the committee on weight and height measurements of children, headed by Dr. Emmet Holt, of New York City. In this class of activities may also be mentioned the assistance and advice which has been at various times requested by State and local health officers on questions of statistical forms and analysis. A number of reports and articles of a statistical nature which were submitted for publication either in the Public Health Reports or as Public Health Service bulletins have been critically reviewed by the staff of the Statistical Office.

III. STATISTICAL STUDIES.

1. *Studies in morbidity.*—In the belief that the knowledge of the actual incidence of disabling sickness and of at least the most important infectious diseases is fundamental to efficient public health administration, a series of studies has been begun for the purpose of collecting records of disease and disability incidence among various population groups. Such a series of studies, it was believed, would not only afford epidemiological material of value, but it would contribute valuable experience in the most practical and effective methods of morbidity reporting and methods of making morbidity surveys, and in the keeping of current records of disability as well as of the incidence of disease among special population groups, such as school children, employees of industrial establishments, and the like. It was also felt that these studies would be helpful in the establishment of a morbidity registration area for certain diseases in the United States, as proposed in resolutions passed by the annual conference of State and Territorial health officers with the Surgeon General at Boston in 1921. A special committee from this conference was authorized to work with the Statistical Office on the question of a morbidity registration area, and it is proposed to utilize such material as is collected in the course of these studies, and to furnish the

committee with such results of these studies as may be of value in the working out of this plan.

The morbidity studies are along two general lines: morbidity reporting and morbidity incidence.

(a) *Morbidity reports.*—This study is being conducted along three lines: (1) A study of report forms actually in use by various State and local health departments for the purpose of developing a standardized set of the most practicable and economic forms possible, from the point of view of administration; (2) a study of report forms used for certain acute infectious diseases from the points of view of health administration and the collection of epidemiological data; (3) the possibilities of the statistical use of the data so collected.

As a basis for this study a collection has been made of report forms used by a large number of State and local health departments, personal visits have been made to several local and State departments for the purpose of studying the reporting systems in operation, and analyses have been made of actual reports. An analysis of over 8,000 venereal disease case reports in Indiana has been published under two titles (see Venereal Diseases). This study showed that from an epidemiological point of view the items relating to color, age, and sex were of distinct value, but that the great majority of the inquiries included on the venereal disease case report card could not be utilized for any purpose because of the incompleteness of the reports and the inaccuracy of the entries. The main conclusion suggested was that the reporting physician is burdened with too many questions of an epidemiological character and should not be required to report any information except that which is essential to prompt and effective health administration, and it was recommended that purely epidemiological information should be collected in a more systematic way by carefully planned studies if it is to yield reliable results. A tabulation and statistical analysis of case reports was made of a number of diseases within the extra-cantonment zones during the period of the war. Through the courtesy of the Maryland State board of health, a similar analysis was made of the reports of pulmonary tuberculosis in Maryland for a period covering several years. The results of these two last named analyses have not yet been presented for publication. It is proposed to make similar studies of other reports and to present them in connection with a study of report forms for the information of health departments.

(b) *Morbidity incidence.*—The collection of material relating to the actual incidence of certain diseases and of disabling sickness has been continued. Through the cooperation of a considerable number of industrial establishments, reports of the occurrence of disabling sickness with diagnosis for each case are made available for current compilation and analysis. This covers a large adult wage-earning population and is described more fully under the head of "Industrial Morbidity Reports." In cooperation with field investigations of child hygiene, an attempt is being made to utilize the school records as records of disability and of disease incidence among school children. A preliminary study was made in a number of localities in Missouri in 1920-21, and during the school session of 1921-22 a

large number of schools will cooperate with the Public Health Service in this respect.

In connection with this work, certain field morbidity studies are planned for the ensuing fiscal year, whereby it is hoped that not only the actual morbidity in populations of considerable size may be recorded, but that practical methods of reporting morbidity and of checking the results with actual morbidity records may be developed.

Although the collection of morbidity data is of necessity slow, since the machinery for obtaining dependable records must be developed, it is believed that eventually a sufficiently large amount of material will be made available for constructing sickness expectancy tables as well as for analysis according to some of the more important factors involved.

2. *Studies in mortality.*—(a) *Specific mortality rates from certain causes.*—Through the courtesy of the Vital Statistics Division of the Bureau of the Census, unpublished mortality data according to age for either sex from certain important causes have been made available for statistical analysis. The presentation of some of this material is about ready for publication. When completed, it will consist of two series of papers: (1) Mortality rates per hundred thousand at different ages for either sex from all causes, tuberculosis (all forms), pulmonary tuberculosis, influenza, pneumonia (all forms), respiratory diseases, typhoid fever, cancer, nephritis, organic heart disease, and Bright's disease. For each registration State in 1910, the rates have been computed on a five-year average mortality for the period 1908–1912. This presentation will compare for States the specific mortality rate for either sex from each of the diseases named; (2) a series of correlations in order to discover what associations might exist among death rates from various causes at similar ages and in different States. The material so far collected begins with the year 1900 for those States which were in the registration area at that time and continues up to 1920. For 10 States it has been possible to further subdivide these data according to "urban" and "rural," and the presentation of the data has been made according to this classification. Practically all of the collection of material and the computations of rates have been completed. The correlations are yet to be made.

(b) *Trend of mortality from certain important causes.*—A compilation of such material as is available in the published reports has been begun on the course of mortality from certain important causes, including those mentioned above in connection with certain mortality studies. The records of Massachusetts have been brought together for this purpose and tables have been completed showing the course of mortality from each of these diseases at each age group, beginning with a few years prior to 1860. With the assistance of Dr. William H. Guilfooy, registrar of records, New York City health department, certain compilations of similar material have been made from the records of that office and will be available for similar presentation and analysis. It is the purpose to present these tables with appropriate comment and graphic illustration in order to make available, for the use of vital statisticians and students of epidemiology, the more important facts relating to the incidence of mortality at various

ages and in different periods during the past half century or more in the United States.

3. *Studies in statistical methods.*—In connection with various studies which have been made by the Statistical Office independently or in cooperation with other offices, it has been found necessary to make certain applications of statistical methods to vital statistics and health problems which heretofore had not been fully developed. A considerable part of the time of certain members of the staff, therefore, of necessity has been devoted to the consideration of how certain well established statistical procedures and methods can be best utilized in the simplest and most practicable ways. These have included the application of the theory of probability in a number of ways to vital statistics and to statistical studies, the method of correlation and multiple correlation, the use of mathematically calculated curves by the method of least squares; devising various means of expressing the relative variations in age incidence where complete data is not available for computing true incidence of diseases, and the like.

IV. INDUSTRIAL MORBIDITY REPORTS.

The plan to obtain current statistics of disease prevalence among sample groups of industrial establishments and employee sick-benefit associations was further developed during the year and some of the statistics presented in three articles appearing in the Public Health Reports. While the number of reporting establishments and the size of the working force in plants which were able to report their morbidity experience throughout the year were both reduced by the general depression in manufacturing, plant physicians have manifested keen interest in the development of standardized sickness records, and their requests for assistance have been numerous in working out morbidity records that would be in harmony with the general plan. Assistance has been given to about 40 firms through correspondence and by means of personal interviews.

The following summary shows the number of industrial establishment sick-benefit organizations cooperating with the Statistical Office.

Sick-benefit organizations sending morbidity reports to the United States Public Health Service.

Establishment sick-benefit organizations.	Number.	Number of employees to which the reports apply.
Sending monthly reports.....	45	97,760
Sending annual or special reports.....	10	60,248
Total.....	55	158,008

During the latter part of the fiscal year considerable morbidity material was collected from the records of two large employee sick-benefit associations in Chicago, which will make possible the publication of a study of disease occurrence, particularly from the stand-

points of age, sex, nationality, and the diseases causing disability among approximately 19,000 wage earners during the last five years.

In addition to the articles in the Public Health Reports on current industrial morbidity, the following special articles on the subject were published during the year:

"Sickness and Absenteeism in a Large Industrial Establishment during 1919," Public Health Reports of September 10, 1920.

"Diseases Prevalent Among Steel Workers in a Pennsylvania City," Public Health Reports of December 31, 1920.

"Establishment Sick-Benefit Records as a Source of Industrial Morbidity Statistics," read before the annual meeting of the American Statistical Association at Atlantic City, and published in the March (1921) "American Statistical Association Quarterly."

V. STATISTICAL STUDIES IN COOPERATION WITH OTHER OFFICES AND DIVISIONS.

1. *Child hygiene*.—In cooperation with field investigations of child hygiene, Surg. Taliaferro Clark in charge, a statistical analysis was made of the results of a study of infant feeding conducted in Boston. The results showed that the increase in weight of the infants in the whole milk-powder group was more rapid than in the group fed on cow's milk or the group fed on milk reconstructed from unsalted butter and skimmed milk powder. The latter group appeared to increase more rapidly than those fed on cow's milk, but the difference was not great enough to draw any very definite conclusions.

A study was made of the heights and weights of 14,335 native white children of Maryland, Virginia, North Carolina, and South Carolina collected in previous field investigations. A table was prepared to show by sex and age the mean weight (smoothed) at each height.

For this group of children, tables of weight, height, chest expansion, defective teeth, vision, nutrition and vaccination of school children were also made for 15 localities of the United States. The results of these studies are being prepared for publication.

A preliminary study was made of sickness among school children in 13 representative localities of Missouri. It was found that these children lost on account of sickness an average of over 5 per cent of the total possible days of school attendance. The girls lost only slightly more time from sickness than the boys. The chief causes of absenteeism were found to be colds, measles, mumps, scarlet fever, whooping cough, and chicken pox. The results were summarized in a paper by Asst. Statistician S. D. Collins entitled "Sickness Among School Children," published in the Public Health Reports, volume 36, No. 27, July 8, 1921.

A series of charts was prepared for exhibition at a child hygiene conference held at Montreal, Canada. These charts showed the results of field studies relating to defective teeth, nutrition, sickness, height and weight and common infectious diseases of children.

2. *Statistical and epidemiological studies of influenza*.—The statistical and epidemiological studies of influenza which were begun during the winter of 1918-19 under the direction of Surg. W. H. Frost and Statistician Edgar Sydenstricker have been continued through-

out the past year at the Statistical Office. In this work the influenza commission of the Metropolitan Life Insurance Co. has rendered very substantial assistance, furnishing an assistant statistician and two clerks assigned to the Statistical Office to work with the statistical force of the service.

During the three years since these studies were begun a large mass of data has been collected and analyzed, including:

(1) The records of special surveys made in a number of cities and a rural county during the winter of 1918-19 to accurately determine the incidence, severity, and fatality of influenza in representative population groups, and their relation to color, sex, age, housing, and economic status. These records comprise about 150,000 people in 13 localities.

(2) A similar survey of a large population group in Baltimore, made immediately following the epidemic of 1920, for the purpose of comparing this with the epidemic of 1918, especially in relation to the immunity of persons attacked in 1918.

(3) Detailed morbidity reports from Kansas and Maryland, furnished by the health authorities of those States.

(4) Detailed records of the monthly mortality from influenza and pneumonia in the registration area of the United States, since 1910, and in certain areas for a larger period.

(5) Records assembled from various sources, showing the course of mortality in foreign countries during the epidemic of 1918.

A number of reports based upon these data have been issued from time to time, most of them having been published in the *Weekly Public Health Reports*, and two additional reports are now ready for publication. The data have also been used extensively in the preparation of current reports upon the prevalence of influenza in the United States since 1918, especially during the epidemic of 1920. Work during the past year has, however, been devoted chiefly to extending the analyses already presented and embodying them into a monograph which will present all the data in a more orderly and significant relation than has been possible in the brief special reports heretofore issued.

Upon completion of this monograph, which will be ready for publication within a few months, it is expected that the separate organization established for statistical studies of influenza will be discontinued, further work in this line being turned over to the Statistical Office as part of the study of current morbidity.

The investigation has not solved the many problems in the epidemiology of influenza with which it has been concerned. It has, however, contributed materially to a better understanding of the recent epidemic in its relation to the inter-epidemic prevalence of influenza and pneumonia; and has furnished, as to certain phases of the epidemic, the most exact and extensive record as yet available, a record which will certainly be of increasing value and significance in future years as additional facts are added to the present incomplete knowledge of influenza.

3. *Venereal diseases*.—In cooperation with the Division of Venereal Diseases, and with personnel detailed from that division to the Statistical Office, the tabulation and analysis of case reports of venereal diseases in a number of States has been continued. A special

tabulation was made of approximately 8,400 reports from the State of Indiana. The first analysis was in order to determine as accurately as possible, using the case reports as samples, the incidence of the various venereal diseases at each age among persons of different sex and marital condition. This study corroborated the preliminary analysis made of venereal-disease case reports collected in cantonment areas during the war, and showed, among other things, that venereal disease incidence was highest in the young adult ages, that gonorrhea occurred at earlier ages than syphilis, and that the incidence of venereal disease was earlier among females than among males. These results were put in a paper entitled "A Tabulation of 8,413 Case Reports in Indiana" (Public Health Reports, Dec. 24, 1920). A second study, which was in the press at the end of the year, was of the value of certain inquiries on venereal-disease case reports, to which reference has already been made under the head of "Studies in Morbidity." The tabulation of these report cards has been practically completed for four other States, namely, Louisiana, Mississippi, Arkansas, and Georgia.

4. *Pellagra*.—The statistician in charge from time to time rendered assistance in the analysis of the results of field studies in 1916-17 and in the planning of statistical phases and other studies during the year and for the coming year.

COLLABORATING AND ASSISTANT COLLABORATING EPIDEMIOLOGISTS.

During the fiscal year ended June 30, 1921, advance was made in the work of securing information of the prevalence and geographic distribution of diseases dangerous to the public health. The system of securing reports by appointment of officers of State and local health departments as agents of the Public Health Service has been extended. While these reports are far from complete, and improvement in many ways is desirable, the reports have been received from more sources than ever before, and an earnest effort is being made in many States to secure reliable reports and to transmit them promptly to the Public Health Service.

During the fiscal year collaborating epidemiologists were appointed for the first time in four States—Arizona, Colorado, Idaho, and Oregon. Officers of local health departments which are able to supply useful information are appointed as assistant collaborating epidemiologists. Appointments of this nature were made for the first time in five States—Arizona, Colorado, Louisiana, Oregon, and Virginia. The number of assistant collaborating epidemiologists was increased in 13 States, the increases varying from one additional officer in Alabama, Arkansas, Kentucky, and North Carolina to 464 additional in Maine. The total increase in the number of assistant collaborating epidemiologists during the fiscal year was 1,059, or 37.8 per cent.

The accompanying table shows the number of these officers serving in each State for each fiscal year 1918 to 1921, inclusive.

States.	Collaborating epidemiologists.				Assistant collaborating epidemiologists.			
	1918	1919	1920	1921	1918	1919	1920	1921
Alabama.....	1	1	1	1	8	8	67	68
Arizona.....				1				14
Arkansas.....	1	1	1	1			218	227
California.....			1	1			290	295
Colorado.....				1				179
Connecticut.....	1	1	1	1				
Delaware.....		1	1	1				
Florida.....		1	1	1			1	3
Georgia.....	1	1	1	1	4	11	20	23
Idaho.....				1				
Illinois.....	1	1	1	1			101	101
Indiana.....							543	543
Iowa.....	1	1	1	1				
Kansas.....	1	1	1	1		109	113	115
Kentucky.....	1	1	1	1		36	133	134
Louisiana.....	1	1	1	1				2
Maine.....			1	1			7	471
Maryland.....	1	1	1	1		83	82	82
Massachusetts.....	1	1	1	1			209	356
Michigan.....			1	1			5	4
Minnesota.....	1	1	1	1			1	1
Mississippi.....	1	1	1	1			22	42
Missouri.....	1	1	1	1			99	119
Montana.....	1	1	1	1				
Nebraska.....			1	1			95	95
New Jersey.....	1	1	1	1				
New Mexico.....							66	66
North Carolina.....	1	1	1	1	93	106	107	108
Ohio.....	1	1	1	1			145	145
Oklahoma.....	1	1	1	1			1	1
Oregon.....				1				120
South Carolina.....	1	1	1	1				
Texas.....			1	1			198	198
Vermont.....	1	1	1	1		10	10	10
Virginia.....	1	1	1	1				15
Washington.....	1	1	1	1		19	20	20
West Virginia.....		1	1	1		77	106	106
Wisconsin.....			1	1			144	199
Total.....	23	26	32	36	105	459	2,803	3,862

STATE MORBIDITY REPORTS.

WEEKLY TELEGRAPHIC REPORTS.

At the close of the fiscal year 36 State health departments were reporting weekly by telegraph summaries of the reported cases of communicable diseases. These reports are preliminary and subject to correction as later returns are received, but they furnish a valuable index of disease conditions throughout the States and give timely warning of dangerous outbreaks or conditions which require action to prevent the spread of disease. The reports are published in the Public Health Reports each week.

The following table shows the States reporting :

Alabama.	Iowa.	New Jersey.
Arkansas.	Kansas.	New Mexico.
California.	Kentucky.	New York.
Colorado.	Louisiana.	North Carolina.
Connecticut.	Maine.	Ohio.
Delaware.	Maryland.	South Dakota.
District of Columbia.	Massachusetts.	Texas.
Florida.	Minnesota.	Vermont.
Georgia.	Mississippi.	Virginia.
Idaho.	Missouri.	Washington.
Illinois.	Montana.	West Virginia.
Indiana.	Nebraska.	Wisconsin.

MONTHLY REPORTS.

The health officers of 40 States, the District of Columbia, and the Territory of Hawaii have sent to the Public Health Service monthly reports of the prevalence of communicable diseases in their jurisdictions. These reports give for the more important diseases the number of cases by counties, cities, and other subdivisions. A summary for each State for the month is published as soon as practicable after receipt, and the details are compiled, tabulated, and published in quarterly installments. This plan makes the data more readily accessible for comparison and study than the former method of publishing each report in full when received.

These reports were sent by the following-named States:

Alabama.	Kansas.	North Dakota.
Arizona.	Louisiana.	Ohio.
Arkansas.	Maine.	Oklahoma.
California.	Maryland.	Oregon.
Colorado.	Massachusetts.	Pennsylvania.
Connecticut.	Michigan.	Rhode Island.
Delaware.	Minnesota.	South Carolina.
District of Columbia.	Mississippi.	South Dakota.
Florida.	Montana.	Vermont.
Hawaii.	Nebraska.	Virginia.
Idaho.	New Jersey.	Washington.
Illinois.	New Mexico.	West Virginia.
Indiana.	New York.	Wisconsin.
Iowa.	North Carolina.	Wyoming.

ANNUAL SUMMARIES.

Three pamphlets have been issued giving summaries of the reported cases of communicable diseases during the calendar year 1920 in States, large cities, and smaller cities, respectively. The large cities include all having 100,000 population or more, and cities having less than 100,000 population but more than 10,000 are classified as smaller cities.

MORBIDITY REPORTS FROM CITIES.

Blank cards for making weekly reports of morbidity from preventable diseases were sent to all cities in the United States having more than 10,000 population. Reports were received weekly from 520 cities, an increase over the preceding year of nearly 1.6 per cent in the number of cities. Some of the cities were irregular in reporting, and some were not able to give all of the data desired, but there has been a notable improvement in the number and accuracy of these reports during the last few years. The data were tabulated and published each week in Public Health Reports.

MORBIDITY REPORTS FROM FOREIGN COUNTRIES.

Reports of the occurrence of cases of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases have been received from consular officers of the United States and from officers of the Public Health Service who were stationed abroad. Summaries of the reports have been published in Public Health Reports each week for the information of quarantine officers and others interested.

SANITARY LEGISLATION.

Two volumes of State laws and regulations pertaining to the public health were issued during the fiscal year, containing health measures enacted during the years 1917 and 1918. At the close of the year a volume of municipal ordinances and regulations pertaining to public health was in press. This volume includes measures adopted from 1917 to 1919, inclusive.

Current legal digests and reports are examined, and court decisions relating to health administration or to matters affecting the public health are abstracted and published for the information of health officers and other sanitarians.

PUBLICATION OF SANITARY DATA.

Pursuant to the provisions of section 4 of the act of April 29, 1878 (20 Stat. L., 37); section 4 of the act of February 15, 1893 (27 Stat. L., 449); section 8 of the act of July 1, 1902 (32 Stat. L., 712), and other acts, the weekly Public Health Reports have been issued regularly and distributed to "collectors of customs, State and municipal health officers, and other sanitarians." This publication contained 3,128 pages during the fiscal year, exclusive of indexes. Seventy-three articles were issued separately as reprints for economical distribution.

PREVALENCE OF DISEASE.

The summaries of the prevalence of communicable disease in the United States and foreign countries, which have been included in former annual reports, can be found, in substance, in the Public Health Reports, as follows:

Prevalence of communicable diseases, 1920:

In States, Public Health Reports, August 5, 1921, page 1800.

In large cities, Public Health Reports, May 13, 1921, page 1037.

In small cities, Public Health Reports, September 30, 1921, page 2351.

In foreign countries, Public Health Reports, June 25, 1920, page 1563; December 31, 1920, page 3195; July 1, 1921, page 1535.

HOSPITAL DIVISION.

The increased activities of this division, to which reference is made in my last annual report, have continued during the present fiscal year, even in larger volume. This increased work is due, as reported, to the responsibility placed upon the Public Health Service by the provisions of public act 326 of the Sixty-fifth Congress, which, in effect, authorized this service to provide hospital and sanatorium facilities necessary in the medical care of disabled veterans of the World War. Although, as noted below, some changes were made in the latter part of this fiscal year, relieving this division of some of its responsibility, nevertheless the division continued to supply, throughout the greater part of the year, probably more than 80 per cent of the medical care and treatment furnished to ex-service men and women.

Besides administrative changes, which have had a rather radical effect upon the method of administering services to ex-service men and women, there is now pending in Congress legislation which will make even wider changes and require a great deal of reorganization in the performance of this important work, in all of which the Hospital Division will be seriously interested. It would seem from present indications, however, that whatever policies may be adopted or whatever legislation may be passed in this regard, the Public Health Service will almost, of necessity, for sometime to come, be charged with a large share of the responsibility for supplying medical and hospital care to disabled veterans of the World War.

It will be recalled that this responsibility was rather suddenly placed upon the Public Health Service and this service found itself rather unexpectedly facing what proved to be a real national emergency. In order to meet this emergency, the Public Health Service has formed a large medical and hospital organization, which now, for almost two years, has successfully furnished to ex-service men and women a large part of the medical care provided for them by law. It would seem, therefore, very unwise to disrupt this organization and place this responsibility elsewhere, unless sufficient time were given to make the adjustments which would be necessary to prevent confusion in the work. The Public Health Service, in other words, has in an emergency furnished these necessary facilities and discharged this responsibility. Frequent statements have been made, however, that this responsibility is really one which should not be placed upon the Public Health Service and that this service should be relieved of this responsibility. The Public Health Service has no desire to place itself in an attitude which would warrant criticism, but desires to serve in any way necessary the interests of ex-service men and women, and feels a pride in doing so.

STATUS AT CLOSE OF FISCAL YEAR.

During the present fiscal year there has been much public discussion concerning the administrative organization which had been formed under the law, not only for furnishing medical care and treatment, but also for paying compensation and supplying vocational training to ex-service men and women. In this discussion none of the agencies which are now engaged in these activities have escaped criticism, some of which has been unduly severe. This matter has also received attention in Congress, and, at the present time, legislation of a rather radical character is pending in that body.

This discussion and criticism became so acute during the year, and the matter seemed one of so much importance, that the President finally called a special committee together for the consideration of the entire problem. This committee, after holding public sessions, at which all interested persons were invited to express their opinions, finally made formal recommendations to the President concerning the formation of a new administrative program, with the idea of consolidating, to a large extent, the different phases of the work and placing, as far as possible, upon one organization the entire responsibility for the care of veterans of the World War.

So far as the Public Health Service is concerned, executive action was taken upon the recommendations of this committee, with the result that, on April 19, 1921, the Secretary of the Treasury issued an order, the effect of which was to relieve the Hospital Division of a certain share of its responsibility and transfer the same to the Bureau of War Risk Insurance. In a broad way, this order contemplated placing upon the Bureau of War Risk Insurance the administrative responsibility which had previously been discharged by the Hospital Division through its organization of district supervisors, and also the responsibility for making those medical examinations which were necessary for disability ratings and the payments of compensation. It left the Public Health Service as an agency which would be concerned thenceforth only in medical care and treatment, either in hospital or in dispensary.

The effect of this order has been to make more definite the responsibility of this division and to permit, at least, the beginning of a reorganization upon what is believed will be a more or less permanent basis. It also permitted a large reduction in the personnel of the Hospital Division, both in the field and in the central office at Washington. The reorganization, particularly of the Washington office, under this order was not completed during this fiscal year, but as soon as anticipated legislation in Congress shall have been passed it is believed that this division will be in a position to complete its reorganization promptly, as well as able to formulate more specific policies as to its future work.

Previous to the issuance of the Secretary's order quoted above, and even since that time, the position of the Hospital Division and of the Public Health Service, in its work for the veterans of the World War, has not been without its embarrassments. This situation was referred to in my last annual report. Under the administrative organization formed for the care of ex-service men and women, the Public Health Service, of necessity, had to adopt the

attitude of adjustability and make itself the instrument by which medical and hospital facilities could be increased or diminished to meet demands. This has very strongly militated against the creation of a very satisfactory organization and the adoption of fixed policies. Such a state of affairs has also made the management of finances one of considerable difficulty and has done much to prevent as economical administration as could have been inaugurated under better conditions. This has proven to be a matter of fundamental importance and every effort has been made repeatedly to establish on a more definite basis the position which the Hospital Division has occupied with regard to this work.

COOPERATION WITH OTHER BUREAUS AND ORGANIZATIONS.

The cooperation with certain other bureaus of the National Government, notably the Bureau of War Risk Insurance and the Federal Board for Vocational Education, has, of course, been continued, and it has been the attempt of the Hospital Division on all occasions to cultivate with these bureaus the very best relationships.

There has occurred a change in the policy of the Bureau of War Risk Insurance during the year with regard to the use of medical officers of this service. The chief medical adviser of that bureau, who had been an officer of the Public Health Service, was, during this year, replaced by a civilian medical man. Many of the subordinate medical officers remain. The Secretary's order mentioned above contemplated the detail of officers from the Public Health Service to the Bureau of War Risk Insurance, and this was done rather extensively for a time subsequent to the transfer to the Bureau of War Risk Insurance of the district supervisors' offices. The details of this matter will be found in the personnel section of this report.

In this connection should be again mentioned the cooperation which has been extended to the Public Health Service by the American Red Cross. This organization, as previously reported, is discharging the function of a medical social service for sick and disabled ex-service men and women undergoing treatment in the hospitals of this service. This has required an extensive organization and the work has been done satisfactorily. Some question has arisen during this year as to whether this work should not be carried on by the National Government and the American Red Cross thus relieved of the financial burden, which is rather heavy. This matter was the subject of numerous conferences at various times, but fortunately the American Red Cross has found itself able to continue this work and has undertaken to do so for sometime to come. The Public Health Service is under obligation to this organization for its hearty cooperation and excellent support, both in this and in other matters connected with this very important work.

Mention might also be made of the fact that the Public Health Service has also received hearty cooperation and support from numerous organizations of an unofficial character. Our relationships with the American Legion have been fortunate, and we have sustained similar relations with the Veterans of Foreign Wars and other organizations of ex-service men and women, as well as with a varied number of other organizations. It is desired to express

appreciation for the courtesy and support which have been extended to this service by all these organizations.

ORGANIZATION.

CENTRAL OFFICE.

As mentioned above, the Hospital Division, by reason of changes in administrative organization, has again begun a reorganization and a retrenchment. The organization will probably not be completed until something definite is known concerning the legislation, which is now pending in Congress, and which would seriously affect the character of this work. With the reduction of its responsibility, however, the Hospital Division has reduced its personnel and placed itself in such a position that it can rather rapidly reorganize on the new basis contemplated in the anticipated legislation mentioned. It is felt, however, unwise to take further steps in this matter until something more definite is known. The division still occupies the temporary buildings at Seventh and B streets SW., and now has sufficient room for its purposes.

The organization reported last year, with some changes, has continued to be the same in its general features, notwithstanding a considerable reduction in personnel, as mentioned above. The plans of reorganization contemplate, however, a greater consolidation, with a sharp reduction in a number of sections and combinations, which will permit, it is hoped, better results.

FIELD ACTIVITIES.

The field activities of the Hospital Division have undergone one radical change, and that is the transfer of the offices of the district supervisors to the Bureau of War Risk Insurance, as required by the Secretary's order. This has removed from the supervision of the Hospital Division a very important administrative organization, employing a numerous personnel and doing a large volume of work. This organization, which was created by the Public Health Service, had performed, and will undoubtedly continue to perform, a highly useful and important service. It is understood that its organization will undergo some radical changes under the Bureau of War Risk Insurance. It is believed that it is a necessary instrument in furnishing to ex-service men and women the care and attention contemplated under the law. It was felt that the transfer of this organization to the Bureau of War Risk Insurance was logical and wise. It dealt almost entirely with administrative matters, which pertain just as much to the Bureau of War Risk Insurance as to the Public Health Service, and its creation and organization by the Public Health Service was largely a matter of circumstances. The Hospital Division could not help but feel a pride in having created such an organization.

In the transfer of this organization to the Bureau of War Risk Insurance, very happy adjustments were made with that Bureau whereby this transfer took place with a minimum of disturbance and over a considerable period of time. As a matter of fact, the Hos-

pital Division is still, in some minor matters, carrying on certain functions which will ultimately be transferred to the Bureau of War Risk Insurance, and there still remains with the district supervisors' organization some commissioned personnel, who will soon be withdrawn. The agreements between the two bureaus involved were to the effect that the Hospital Division would carry on all functions hitherto carried on until the War Risk Insurance Bureau should assume the same, and so notified the Hospital Division. In this way, there was an uninterrupted service to the individuals involved.

In the transfer of this organization, there were still left temporarily, at least, under the supervision of the Hospital Division certain districts outside of the continental United States. These districts are the Hawaiian Islands, the Panama Canal Zone, Porto Rico, the Virgin Islands, and the Philippine Islands. The work in these fields was not of sufficient consequence to justify the establishment of a district supervisor and organization similar to that obtaining in the continental United States, and has always been carried on by officers of the Public Health Service detailed to these various places for other duties and discharging the functions of a district supervisor along with their other duties. These men are all under the instructions of the Bureau of War Risk Insurance, so far as affects the work of that bureau. The arrangement has been satisfactory and economical, and will be continued so long as the Bureau of War Risk Insurance desires it.

HOSPITALS.

The question of supplying adequate hospital facilities for the care of ex-service men and women has, throughout the year, continued to be acute. The Hospital Division has felt no relief of the pressure which has always existed in this matter. Under some changes in administrative arrangement, more beds have become available in hospitals of the Army and Navy and in the national homes for disabled volunteer soldiers, but the demand for beds, especially for certain classes of patients, has continued so heavy that the Public Health Service has, at the request of the Bureau of War Risk Insurance, continued to increase its facilities.

During the year, the hospitals of the United States Public Health Service were increased more than 25 per cent and the bed capacity to more than 18,700 beds. Arrangements were also completed by which, during the next few months, there will be added between 3,500 and 5,000 beds to these facilities. It is possible that, by the addition of these beds, opportunity will be given to close some unsatisfactory hospitals.

The Hospital Division has continued in operation practically all the hospitals which were in use during the past fiscal year, notwithstanding the fact that many of these places are very unsatisfactory and do not permit a service to veterans which is commendable. This was necessary because sufficient beds were not obtainable in any other way. The condition of these hospitals has not been concealed; it is a matter of public information and official reports. It is the earnest hope of the Hospital Division that some of these unsatisfactory places may be closed as soon as possible. They subject the

Public Health Service to criticism and they are extremely expensive places to maintain and operate. During the year some of these institutions, which are not fireproof, have been the scenes of rather destructive fires, in which fortunately no one has been injured. Fires of some consequence have occurred, namely, at base camp hospitals of temporary construction, which were taken over from the Army, notably at Alexandria, La., and at Palo Alto, Calif. The destruction of buildings and property amounted to many thousands of dollars and caused a serious interruption in the proper performance of the work of the hospitals involved. It should be mentioned that the extension of hospital facilities in one direction and the closing of such facilities in another is by no means an economical administration. The opening and closing of hospitals is rather an expensive process and it has been found, from the experience of the Hospital Division, that the closure of hospitals is unusually expensive. Such institutions as have been closed have almost invariably required a rather long period of maintenance before it was possible to make a final settlement of all of the difficulties involved. This use of unsuitable properties and closure of same upon acquirement of better facilities has meant the maintenance of some personnel and costs in transportation, together with loss and destruction of property, all of which adds considerably to the burden of expense.

The Hospital Division has spared no effort during the year to improve the efficiency of its hospital organization and administration, and, while conditions in all respects are not ideal, yet there is a firm feeling that there has been a steady and continuous improvement in the administration of the hospitals of this division. It is hoped that this improvement will continue, and every effort will be made to place these hospitals in as satisfactory a condition as circumstances will permit.

The question of hospital construction has, during the year, been one of great interest. By the passage of Public Act 384, of the Sixty-sixth Congress, approved March 4, 1921, Congress made available for hospital construction a total of \$18,600,000. The expenditure of this money was intrusted by the Secretary to a special committee appointed by him, and this committee has held numerous conferences and sessions during the year, at which representatives of the Public Health Service have frequently been present. Indeed, representatives of the Public Health Service have been in constant and close contact with this committee and have discussed with them on numerous occasions all the various phases of this very important problem. When the committee's plans are completed and the construction contemplated therein has been finished there will undoubtedly exist in a great many places far better and more satisfactory facilities for the care of ex-service men and women. It is believed that this policy may have to be extended. If so, additional funds would be required. This, however, is a matter which would have to be determined in accordance with the facts in the case.

There are some good reasons for believing that perhaps the next fiscal year may see the peak of this hospital load reached, if not passed. It is believed from the data collected that the peak of the load, with regard to general medical and surgical cases, has already been passed, and it would appear that the peak of the load for cases

of tuberculosis of the lungs may have been perhaps almost reached. The peak of the load with regard to neuropsychiatric cases has, however, probably not yet approached. In any event, there is a general feeling by those closely in touch with the situation that perhaps now we are, for the first time, in a position where we can measure more or less accurately the entire load and begin to see somewhat clearly what we may have to handle during the coming years. This gives a firmness to recommendations and an opportunity to adopt policies which may be based upon sound information.

The following is a complete list of the hospitals in operation under this service at the close of the fiscal year:

List of United States Marine and Public Health Service hospitals, July 1, 1921.

Type.	No.	Location.	Medical officer in charge.
General.....	2	Boston, Mass.....	Ezra K. Sprague, surgeon.
Do.....	3	Buffalo, N. Y.....	T. C. Quick, surgeon (R).
Neuro-psychiatric.....	5	Chicago, Ill.....	L. M. Wilbor, surgeon (R).
General.....	6	Cleveland, Ohio.....	H. W. Wicks, surgeon.
Do.....	7	Detroit, Mich.....	E. R. Marshall, surgeon.
Tuberculosis.....	8	Evansville, Ind.....	J. E. Weil, passed assistant surgeon (R).
Do.....	9	Fort Stanton, N. Mex.....	M. D. Cohen, surgeon (R).
General.....	10	Key West, Fla.....	G. M. Guiteras, senior surgeon.
Do.....	11	Louisville, Ky.....	L. H. Redman, surgeon (R).
Do.....	12	Memphis, Tenn.....	James Brew, surgeon (R).
Do.....	13	Mobile, Ala.....	J. T. Burkhalter, surgeon.
Do.....	14	New Orleans, La.....	R. E. Ebersole, surgeon.
Do.....	15	Pittsburgh, Pa.....	H. B. Fralic, surgeon (R).
Do.....	16	Portland, Me.....	R. L. Wilson, surgeon.
Do.....	17	Port Townsend, Wash.....	Emil Krulish, surgeon.
Tuberculosis.....	18	St. Louis, Mo.....	L. P. H. Bahrenburg, surgeon.
General.....	19	San Francisco, Calif.....	L. L. Williams, assistant surgeon general.
Do.....	20	Savannah, Ga.....	G. V. Johnson, surgeon (R).
Do.....	21	Stapleton, N. Y.....	G. B. Young, senior surgeon.
Do.....	22	Vineyard Haven, Mass.....	H. S. Mathewson, surgeon.
Tuberculosis.....	24	Palo Alto, Calif.....	J. M. Wheate, surgeon (R).
General.....	25	Houston, Tex.....	M. H. Axline, surgeon (R).
Tuberculosis.....	26	Greenville, S. C.....	J. E. Dedman, senior surgeon (R).
Do.....	27	Alexandria, La.....	W. K. Baldwin, surgeon (R).
General.....	29	Norfolk, Va.....	L. E. Hooper, passed assistant surgeon.
Do.....	30	Chicago, Ill.....	R. H. Heterick, passed assistant surgeon.
Do.....	32	Washington, D. C.....	S. L. Christian, passed assistant surgeon.
Neuro-psychiatric.....	34	East Norfolk, Mass.....	W. A. Ellison, passed assistant surgeon (R).
General.....	35	St. Louis, Mo.....	L. P. H. Bahrenburg, surgeon.
Do.....	36	Boston, Mass.....	R. W. Browne, surgeon (R).
Neuro-psychiatric.....	37	Waukesha, Wis.....	Lawrence Kolb, surgeon.
General.....	38	New York, N. Y.....	W. D. Heaton, passed assistant surgeon.
Tuberculosis.....	41	New Haven, Conn.....	J. E. Ridlon, passed assistant surgeon.
Neuro-psychiatric.....	42	Perryville, Md.....	E. H. Mullen, surgeon.
General.....	43	Ellis Island, N. Y.....	J. W. Kerr, surgeon.
Neuro-psychiatric.....	44	West Roxbury, Mass.....	A. P. Chronquest, senior surgeon (R).
General.....	45	Biltmore, N. C.....	M. H. Foster, surgeon.
Do.....	48	Atlanta, Ga.....	W. C. Sheehy, surgeon (R).
Neuro-psychiatric.....	49	Philadelphia, Pa.....	O. C. Willhite, senior surgeon (R).
Tuberculosis.....	50	Prescott, Ariz.....	R. H. Stanley, surgeon (R).
Do.....	51	Tucson, Ariz.....	N. D. MacArtan, acting assistant surgeon.
General.....	52	Boise, Idaho.....	W. H. Allen, surgeon (R).
Do.....	53	Dwight, Ill.....	P. G. Lasche, surgeon (R).
Do.....	54	Arrowhead Springs, Calif.....	R. L. Allen, passed assistant surgeon.
Tuberculosis.....	55	Fort Bayard, N. Mex.....	H. E. Whitledge, senior surgeon (R).
General.....	56	Fort McHenry, Baltimore, Md.....	T. R. Payne, senior surgeon (R).
Neuro-psychiatric.....	57	Knoxville, Iowa.....	E. A. Barlow, senior surgeon (R).
Do.....	58	New Orleans, La.....	C. McConnelly, acting assistant surgeon.
Tuberculosis.....	59	Tacoma, Wash.....	G. B. Story, surgeon (R).
Do.....	60	Oteen, N. C.....	J. E. Miller, surgeon (R).
General.....	61	Staten Island, N. Y. (Fox Hills).....	J. O. Cobb, senior surgeon.
Neuro-psychiatric.....	62	Augusta, Ga.....	F. E. Leslie, senior surgeon (R).
General.....	63	Lake City, Fla.....	A. P. Goff, surgeon (R).
Tuberculosis.....	64	Camp Kearney, Calif.....	F. H. McKee, surgeon.
General.....	65	St. Paul, Minn.....	C. H. Gardner, surgeon.
Lepet.....	66	Carville, La.....	O. E. Denny, surgeon (R).
General.....	67	Kansas City, Mo.....	Geo. Parcher, surgeon.
Do.....	68	Minneapolis, Minn.....	H. M. Bracken, surgeon (R).
Do.....	69	Newport, Ky.....	W. A. Korn, surgeon.
Do.....	70	New York, N. Y. (Hudson Street).....	H. J. Warner, surgeon.
Do.....	71	Sterling Junction, Mass.....	Karl Reeves, surgeon (R).
Do.....	72	Helena, Mont.....	T. D. Tuttle, surgeon (R).

OUT-PATIENT FACILITIES.

The important question of out-patient facilities, especially for the care of beneficiaries of the Bureau of War Risk Insurance, is, at the present time, somewhat confused, owing to the transfer to the War Risk Insurance Bureau of the functions which have been mentioned above. A great number of the out-patient facilities which have been established by this division as an essential part of the organization of district supervisors were, of necessity, partially transferred along with the district supervisors' offices. The adoption of a general policy between the two bureaus involved, concerning such facilities, has as yet not been possible.

Many of these so-called dispensaries were in reality much more examination centers than real dispensaries. They were primarily established largely for the purpose of making adequate physical examinations rather than for giving medical care and treatment. It was felt, both by the War Risk Insurance Bureau and by the Public Health Service, that organizations of this character pertained rather to the Bureau of War Risk Insurance, but the separation has proven to be by no means easy. It is hoped that it will be possible before very long to adopt some policy which will permit a practical separation between places devoted largely to medical examinations and those devoted largely to medical care and treatment.

Up to the time of the transfer mentioned to the War Risk Insurance Bureau, this service had in operation 200 dispensaries, in addition to the out-patient care and treatment given at the hospitals themselves. The enormous amount of work done in these dispensaries will be shown in the statistics submitted at the end of this report. Through these agencies has been handled a large part of the enormous number of physical examinations which were made for the purposes of establishing disability ratings or feasibility for vocational training.

The development of dispensaries is a matter of much significance in the care of veterans of the World War, especially with regard to certain classes of cases, and, undoubtedly, facilities of this kind will have to be multiplied all over the country. Such facilities, if properly established and skillfully managed, would do a great deal toward lifting the burden from hospitals and would probably prove much more beneficial to the patients themselves. It is a problem which is, by no means, easy of solution, but, at the present time persons most closely conversant with the situation are of the firm opinion that the development of out-patient or dispensary facilities is a matter of great significance, and its importance should not be overlooked.

REGULAR BENEFICIARIES.

Some comment concerning the beneficiaries other than War Risk Insurance patients should be made. The volume of work pertaining to these beneficiaries has shown a steady and rather rapid advance, and a continuation in this respect is to be expected. In addition to the hospital and out-patient treatment afforded these beneficiaries, the volume of which will appear in the statistics attached to this report, it may be added that the work of the Hospital Division in

the care of patients of the Employees' Compensation Commission has increased and should show a much larger increase in the future. It would seem particularly appropriate that the Public Health Service furnish a large part of the medical services in the care of these beneficiaries, and every effort should be made to render to the commission the kind of services desired by them at convenient places.

There have been received, during the year, requests from other departments of the National Government concerning the establishment of out-patient facilities in places where there are large numbers of Federal employes, in order that they might receive the necessary immediate care and treatment contemplated under the act establishing the Employees' Compensation Commission. The establishment of such facilities would, it is believed, be wise and economical, but funds do not exist by which the Public Health Service is enabled to furnish facilities and services of this kind to the extent desired. It is believed that it would be to the interests of the National Government if such requests could be complied with.

Requests have also been received from similar sources concerning physical examinations of applicants under the civil service rules, involving a marked expansion of the facilities at present offered by the Public Health Service for the use of other departments in this regard. Here, again, it is believed that it would be to the best interests of the Government if such services could be afforded to other departments of the National Government. To do so, however, would require an increased personnel and an extension of facilities, for which funds do not exist. It is believed here also that it would be economical and to the best interests of the National Government if this service could be rendered, as requested.

ORGANIZATION OF DISTRICT SUPERVISORS.

As noted above, this entire organization, under the Secretary's order, was transferred to the jurisdiction of the Bureau of War Risk Insurance. Arrangements were made between the two bureaus involved, so that this transfer might be effected in such a manner as not to interrupt the service. The transfer was effected with a minimum of disturbance and, in a short time, most of the functions had been assumed by the Bureau of War Risk Insurance. There still remain some matters of adjustment, which will be made, it is hoped, before very long. The personnel involved in this large organization was, of course, transferred with the organization, except for commissioned officers, who were detailed for a time to the Bureau of War Risk Insurance for the performance of the necessary duties and then released as their places could be supplied. Many of them still remain in the organization. Details will be found in the report of the Personnel Division.

It may be mentioned that this transfer affected only the 14 districts in the continental United States. The five other minor districts, covering the Philippine Islands, the Hawaiian Islands, the Panama Canal Zone, and Porto Rico, and the Virgin Islands, are still managed, for economical reasons, upon a somewhat different basis. Since the Public Health Service is, for other reasons, obliged to maintain offices in these places, and since the work of the War Risk Insurance Bureau in these districts is not of great significance, it has been

arranged between the two bureaus that the offices of the Public Health Service engaged in other activities should, in addition, assume the duty of caring for these districts, and, so far as that duty is concerned, they are subject to the orders of the Bureau of War Risk Insurance. The arrangement has proven satisfactory to both bureaus and will be continued as long as the Bureau of War Risk Insurance desires.

FINANCES.

The detail of finances will be found in the report of the Division of Personnel and Accounts. It seems wise, however, to say that the work of the Hospital Division in relation to beneficiaries of the Bureau of War Risk Insurance has been largely of an emergency nature. This has meant the creation of a large organization in a very short space of time and under circumstances which did not always permit of the most economical methods of administration. Much effort during the present fiscal year has been devoted to improving the administration of all the affairs of the Hospital Division, with special reference to retrenchment, and this effort continues steadily and persistently.

Radical changes have been made in many respects with the installation of improved methods of accounting, and arrangements completed for the adoption of a satisfactory allotment system based on a careful computation of per diem costs. These and other economical methods will be extended and improved as rapidly as possible.

SUMMARY.

During the fiscal year, the hospitals of this division have been increased by about 25 per cent, and, as noted, arrangements exist for additional beds in the near future. Nearly 137,000 War Risk Insurance beneficiaries and a total of 183,000 of all classes of beneficiaries have been hospitalized. These beneficiaries have received a total of 7,772,000 hospital relief days, of which 6,613,000 were supplied to patients of the War Risk Insurance Bureau. Out-patient treatment has been furnished to 468,000 patients of the War Risk Insurance Bureau and 161,000 other beneficiaries. The total number of such treatments given was 1,473,000. About 884,000 medical examinations were furnished to War Risk Insurance patients and 121,000 to other beneficiaries. Special services of various kinds have been arranged; for example, about 100,000 patients have been given dental treatment. At the present time, about 42,000 physiotherapy treatments are being given each week and about 53,000 hours' work per week in occupational therapy to patients in the hospitals of this service. The statistical details of this summary will be found in the tables attached to this report.

FUTURE PLANS AND RECOMMENDATIONS.

The future plans of the Hospital Division are, of course, dependent upon the limitations of its responsibility and the character and volume of work which are to be performed. As has been pointed out, this division, in its care of patients of the War Risk Insurance Bureau, has always labored under the difficulty of not knowing ex-

actly what its responsibility was in the performance of this work. The developments of this fiscal year and anticipated legislation in Congress would make it appear that the work of this division is to be devoted exclusively to medical care and treatment in hospital or dispensary.

On this basis, the plans of the coming fiscal year would contemplate, in general terms, the consolidation and development of the large hospital and dispensary system which has been established, and the creation of satisfactory and workable cooperative arrangements with the Bureau of War Risk Insurance or whatever organization may be charged with the responsibility for the general care of ex-service men and women. Such plans may involve many radical changes and readjustments of a far-reaching character. Coming developments alone can determine this.

In conformity with these plans, certain recommendations of a very general character, some of which may require legislation, are to be considered. These include the following:

First. As stated, one of the most urgent needs of the Hospital Division is the establishment of a definite status with regard to its work in furnishing medical care and treatment to disabled veterans of the World War. The uncertainty of the position of the Hospital Division in this work has been pointed out above. The constant adjustment to changing conditions has proven, at times, very embarrassing in this work, because it leaves the Hospital Division uncertain as to just exactly what is its responsibility and what are its functions. It is believed that every effort should be made to establish upon a definite basis the exact nature of the responsibility involved and a clearly outlined program of the work.

Second. In supplying, under emergency conditions, hospital facilities to meet the needs of the situation, the Public Health Service has been obliged to acquire control of many unsatisfactory properties, and such properties are to-day being operated for the care of ex-service men and women. They are neither satisfactory nor economical. As rapidly as satisfactory facilities can be acquired, either by purchase or by construction, every effort should be made to abandon, as soon as possible, unsatisfactory plants. It is needless to add that the improvement of existing plants is equally important. More than likely, additional appropriations may be required to put these matters into effect.

Third. Since the Public Health Service is charged with the permanent responsibility for the care of certain beneficiaries other than those of the War Risk Insurance Bureau, and for many years has operated a small chain of hospitals for this purpose, it is believed that, wherever possible, a policy should be adopted for the improvement and the necessary expansion of these permanent hospital facilities, so that ultimately, when the present urgent need is over, there will remain a satisfactory system of hospitals whereby Federal beneficiaries may be furnished adequate medical care and treatment, as contemplated under the law.

All indications point to an increase in the number of these beneficiaries and to the need of additional facilities and better facilities to meet this responsibility. It would seem reasonable to think that in the development of hospital facilities for the care of ex-service men and women, which is, to a large extent, a temporary measure,

consideration should be given to the ultimate acquirement of satisfactory facilities for permanent responsibility.

Fourth. There are certain miscellaneous features in the administration of hospitals which, due to some lack of flexibility in existing legislation, cause embarrassment and prevent the operation of hospitals at their highest state of efficiency. These include certain difficulties in the purchase and management of food supplies, the possible necessity for the creation and maintenance of an organization to discharge the functions pertaining to medical social service, the appointment, where necessary, of chaplains, with the provision of such religious services as will meet the needs of the patients, and the adjustment on a more satisfactory basis of the compensation and allowances for certain necessary personnel, which item will doubtless constitute a definite recommendation from the Personnel Division of this bureau. More detailed recommendations concerning other matters will be found in other parts of this report or will be brought to the attention of the department, as circumstances may dictate.

There follow reports from certain of the individual sections of the Hospital Division, covering the several phases of the work, with more detailed information than has been given. There are also included statistical tables and charts, giving graphic curves of certain data, which, it is believed, will prove of interest in showing the scope and volume of work performed by this division.

RELIEF TO SEAMEN AND OTHER PATIENTS.

As noted, the relief furnished beneficiaries of this bureau other than patients of the War Risk Insurance Bureau has increased in volume. The statistical details will be found in the summary given above and in the various statistical tables and charts which are given later. This being one of the permanent functions of the Public Health Service, and constituting a responsibility which has been placed upon this service for a great many years, deserves most careful consideration in the development of the plans of this division.

The marine hospitals continue to be used largely, but by no means exclusively, for these beneficiaries. All of these hospitals have also been caring for War Risk Insurance patients, and in attempting to do this work have handled patients beyond their real capacities. Most of these plants are in urgent need of expenditures for repairs and extensions. Recommendations concerning these needs will receive attention elsewhere in this report. It is the urgent desire of the Public Health Service to build up sufficient facilities of a satisfactory character to meet the demands of these beneficiaries.

SECTION OF NEURO-PSYCHIATRY.

Due to many administrative changes, the functions of this section have varied to some extent but, as a whole, it has remained one of the important administrative sections of the Hospital Division and has actively managed all of the hospitals devoted to the care of neuro-psychiatric patients. The development of hospitals of this character is by no means an easy problem, and under the circumstances it is not believed any satisfactory arrangement could be made for the organization and administration of hospitals of this particular class, except by the supervision of a personnel skilled in this particular specialty.

As the statistics will show, there has been an increase in the hospital facilities devoted to neuro-psychiatry by 2,976 beds during this fiscal year. Also Fort Logan H. Roots, Little Rock, Ark., and Fort McKenzie, Sheridan, Wyo., have been transferred from the Army to the jurisdiction of the Treasury Department, by an act of Congress, for the use of the Public Health Service as hospitals for this class of patient. Alterations are now being made to adapt these institutions for this purpose. This will increase existing facilities by about 500 beds.

There exists no class of patients which is so poorly provided for in the matter of hospital facilities and for which there is an urgent need of more adequate and more satisfactory arrangements. It is expected that from the appropriations already made by Congress there will be made available considerable additional facilities which will, in part at least, meet the demand, although from present indications it is doubtful whether this sum of money will permit sufficient facilities.

Certain sections of the country are very urgently in need of hospitals of this character and the lack of them causes daily embarrassments in administration. Much time has been devoted to the general problems involved in the care of persons suffering from mental and nervous disorders among veterans of the World War. Careful thought has been given to the development of general policies for their care and treatment. Probably one of the most important policies considered and, in part, acted upon is the establishment of well-equipped out-patient departments so distributed geographically as to meet the needs of the situation. A development of this kind seems logical in the care of these patients, especially in the care of the so-called psychoneurotic group, which constitutes about twenty per cent of the total comprehended under this general class.

The management of this group of patients gives very grave concern and it is by no means easy to determine the best method by which they may be handled. It is a consensus of opinion, however, among medical men versed in this particular field that a large part of this group does not require hospitalization and can be better managed through well equipped out-patient departments. It is the policy of this section to develop such out-patient departments.

Careful surveys have been made of the neuro-psychiatric hospitals which are now in operation and no effort has been neglected to establish in these institutions high standards in the matter of care and treatment. This has proven by no means easy on account of the marked deficiency in medical personnel competent to manage such institutions in accordance with modern ideas and methods. Great difficulty has been experienced in securing such personnel. The demand is far greater than the supply. To meet this demand plans have been considered whereby, on a small scale, young medical officers might be given opportunities in our own institutions by the establishment of a school of training on a very small scale. This would contemplate the detail of selected young officers to certain neuro-psychiatric hospitals where they might obtain not only experience but instruction from older officers. A plan of this character offers the only means by which said medical personnel can be secured for this highly important work.

A great deal of time has, of necessity, been given to the consideration of the location and planning of hospitals to be constructed for the use of neuro-psychiatric patients. This work has been done in conjunction with other agencies of the Government, and a very definite policy concerning the number of beds, the geographic location of hospitals, and the general character of the construction has been developed.

SECTION OF TUBERCULOSIS.

This section has been largely concerned with general policies relating to the examination and treatment of tuberculous patients; training of medical officers in the specialty of the standardization of treatment in tuberculosis hospitals; and plans for new constructions of standard type. A considerable volume of correspondence and business not directly related to the hospital division, but bearing upon the general subject of tuberculosis is routinely handled in this section.

Five attending specialists, selected for recognized ability in sanatorium administration, visited the tuberculosis hospitals to study the methods of treatment employed therein, and recommend such measures as were necessary to amplify and improve the same. Of these specialists, Dr. David Lyman, Dr. Victor Cullen, and Dr. Martin F. Sloan, covered the hospitals in the eastern part of the United States, and Dr. George T. Bonner, and Dr. Henry W. Hoagland visited those in the western part of the United States. Some of the results of their studies are embodied in papers read at the 1921 annual meeting of the National Tuberculosis Association, by Drs. Lyman, Bonner, and Hoagland, respectively.

The training of medical officers has been continued, using the standard seven-day course of study prepared last year, of which 700 copies have been issued. More than 400 medical officers are known to have passed through this course of training, which has been conducted in 26 different institutions. A four-week course of training in tuberculosis for 30 medical officers, and 30 nurses, will be opened in September at United States Public Health Service Hospital No. 60, Oteen, N. C.

Transfers of tuberculous patients in the field to various Government hospitals have been decentralized wherever competent men were assigned on duty at strategic points. This practice, which has greatly facilitated transactions, was continued by the Bureau of War Risk Insurance for the district supervisors, after April 19, 1921. Special measures have been made routine in all tuberculosis hospitals for the early detection and prompt discharge of patients transferred thereto, with a mistaken diagnosis of tuberculosis, or through error in judgment as to need for treatment. The field officer responsible for the error in diagnosis or judgment has been notified in each instance.

Three tuberculosis hospitals have been opened during the year, and the small, unsatisfactory hospital at Markleton, Pa., was closed. At the close of this fiscal year there were 13 tuberculosis hospitals in operation, containing an aggregate of 6,500 beds. With the exception of three of these hospitals located in the extreme Southwest, in regions which are sought chiefly during the winter months, all these institutions were filled to operable capacity at the close of the fiscal

year, there being a total of only 500 vacant beds in the other 10 hospitals, representing unused beds of only 10 per cent of the total available. The number of complaints from tuberculous patients under treatment has materially decreased, indicating more satisfactory hospital conditions, and also a better adjustment on the part of ex-service patients of civilian status.

Through the cooperation of the National Tuberculosis Association, Dr. T. B. Kidner, institutional secretary, was engaged as an attending specialist, to prepare minimum standard requirements for sanatoria. The result of this study, and cuts showing type, were published in Public Health Service Reports, volume 36, No. 24, June 17, 1921.

Nearly 12,000 standard sanitary packages of sputum cups and paper napkins were distributed by the Purveying Service through the district supervisors to tuberculous patients living at home. Replies to a questionnaire addressed to all general hospitals in the United States relative to the number of beds available therein for tuberculosis patients have been tabulated for publication. The status of teaching tuberculosis in medical schools was also ascertained for similar purposes. Articles on tuberculosis were prepared by the chief of the section and published in various medical journals during the year.

SECTION OF MEDICINE AND SURGERY.

This section, which was established later than the other specialized sections noted above, was found necessary in the administration of general hospitals. The development of its work has been rapid and it now is actively engaged in the administration of a large number of hospitals.

It has always been felt that hospital facilities to meet the demands of general medical and surgical cases could be more easily obtained than facilities for any other class of patient. This is due to the fact that contracts can be readily made with very satisfactory general hospitals and that buildings can be generally readily found which, with a moderate expenditure, can be converted into satisfactory general hospitals.

It is also felt, however, that the needs of the general medical and surgical patients have sometimes not been as adequately met as they might have been, and it is undoubtedly true that the treatment of these beneficiaries in governmental hospitals is more satisfactory than in contract hospitals. There are numerous reasons for this which need not be discussed.

The number of general cases is not increasing at a rapid rate and it is felt that patients of this class may have already reached their peak. There will remain, however, a long period when facilities for a considerable number of general cases will still be required. During the fiscal year the admission and discharge rate has been large. This has required a very active personnel to manage this large turnover.

Every effort has been made to establish high standards of treatment and to develop satisfactory special facilities to meet the demands created by the variety of affections met with among general

cases. It is believed that the type of treatment rendered in the general hospitals of this service is comparable to any other institutions in the country. Careful surveys have been made of general facilities and time and effort have been devoted to the consideration of the needs of additional facilities of particular kinds with the location of the same. It has been found advisable to designate certain hospitals for the special care of certain types of cases and the centralization of patients suffering from surgical tuberculosis has received special consideration. The same policy has been applied in the development of special units in various institutions to care for special needs.

A particular effort has been made during the year with regard to general surgery by the establishment in this section of a special temporary unit devoted to this subject. This unit was established for the purpose of making a careful survey of the surgical facilities, equipment, method, and personnel in all of the hospitals of this service with the purpose of standardizing, as far as possible, all of these essential methods.

Inspections were made of 37 hospitals from January 1, 1921, to the end of the fiscal year, and a survey which would complete the inspection of all stations is planned to continue into the ensuing year.

Special investigations of certain equipment were made; notably, appliances for the production of anesthesia; inquiries were also made as to the efficacy of various brands of ether. A standard list of surgical appliances and instruments has been prepared which greatly facilitates the rendering and filling of requisitions; and arrangements have been made with the Purveying Service for the establishment of an exchange system so that unserviceable instruments may be exchanged for new equipment.

Rearrangement of space used for surgical purposes in the various hospitals has been made, and plans for new institutions involving such space have been reviewed in order to provide maximum physical advantages for the performance of good surgery.

Centers for the special treatment of all forms of surgical tuberculosis have been established at United States Public Health Service Hospital No. 41, New Haven, Conn., and United States Public Health Service Hospital No. 45, Baltimore, N. C. Patients suffering from such conditions have been transferred from all stations east of a line passing through Detroit, St. Louis, and New Orleans, to these points where special facilities and especially trained personnel were provided. Similar centers will be established in the West.

A standard fee schedule has been prepared, covering charges to be made for various operative procedures which may be performed by contract surgeons. Certain educational functions have been performed; notably, the establishment of a school of anesthesia for nurses at United States Public Health Service Hospital No. 56; the temporary assignment of surgeons at New Haven for training in the treatment of surgical subjects; and the publication of a manual on first aid and ship sanitation for the use of merchant seamen, couched in the language of the seafaring man for his guidance, when subjected to accident while serving on a vessel carrying a crew too small to require a medical officer. This manual was illustrated, and contained specifications for standard sick bays for merchant ships.

DISPENSARIES.

The development of dispensaries was continued during the year and additional dispensaries have been established at New Haven, Lower Manhattan, New York City, Detroit, St. Louis, and Minneapolis.

The dispensary program was designed to complete the hospitalization program as a further step in providing more adequate care for beneficiaries, especially in the prompt recognition of early disease; the prevention of unnecessary hospitalization, the expeditious admission of cases requiring hospital treatment, and the continuance of observation of discharged cases to prevent relapse. There were 629,000 patients treated during the fiscal year, 1,473,000 treatments were furnished, and 1,005,000 examinations were made.

From the demands for such services it became apparent that a comprehensive plan should be adopted for a system of dispensaries to be established throughout the country. Accordingly, after a study of existing service units, and certain civilian institutions, a program was outlined which provided for dispensaries of three types, depending upon their location, and the size of the immediate and surrounding population, with the probable proportion of ex-service men requiring treatment, and the importance of the center from a railroad or geographic standpoint, and the nearness of existing service agencies.

Type A.—Consists of a complete unit, comprising clinics in internal medicine, general surgery, tuberculosis, neuro-psychiatry, eye, ear, nose, and throat, urology, orthopedics, physiotherapy, dentistry, X ray, clinical laboratory, and pharmacy, occupying approximately 8,500 square feet of floor space.

Type B.—Consists of a similar unit in which the surgical clinic embraces urology and orthopedics, the dental clinic has two chairs instead of six, and the section of physiotherapy is omitted. The floor space occupied is approximately 4,000 square feet.

Type C.—Consists simply of clinics in medicine, surgery, and eye, ear, nose, and throat, with a small laboratory, and occupies less than 1,500 square feet of floor space.

The personnel appropriate for every type of dispensary was indicated and the equipment specified for each component clinic. The approximate cost of the establishment and maintenance of every type of dispensary was estimated. It was proposed to establish 15 dispensaries of type "A," 13 of type "B," and 77 of type "C."

In order to ascertain the existing dispensary facilities of the service, questionnaires were sent to each district supervisor and medical officers in charge of first, second, and third class stations requiring information as to present facilities, and to report their needs in space, equipment, and personnel; also, to forward recommendations as to the establishment of new dispensaries, giving sufficient reasons to justify such action.

In order to maintain closer contact with dispensary conditions in the field, recommendations were made to include all out-patient offices among the inspections to be performed by the Inspection Service. Accordingly, a general order was published by the Inspection Service, which required its officers in the various inspection areas to make inspections and to render reports consisting of descriptions of physical condition, convenience of location, a statement of the amount

and apportionment of floor space, the adequacy of equipment of the office and various clinics or departments, and the number and classification of the personnel employed, with their respective duties, the impression of the inspector as to the efficacy of the system employed, the degree of activity, the general attitude toward patients, and the spirit and apparent grade of professional work performed.

It was found that, in general, the amount of out-patient work performed was underestimated, due chiefly to the manner in which the activities of certain districts were combined in reports. Accordingly, the out-patient forms were revised, and circulars of instruction were issued, by which the amount and character of dispensary examinations and treatments would be shown for each place where out-patient services were rendered.

The floor plans of space in existing stations of the service were reviewed with recommendations for alterations, in order to utilize such space to better advantage, and to increase the facilities. Plans of prospective dispensaries were critically reviewed for the proper allocation of space to the various clinics and departments.

SECTION OF RECONSTRUCTION.

The activities of the reconstruction section for the fiscal year have been in the further development of the plans inaugurated last year for furnishing occupational therapy and physiotherapy to patients of the service.

The number of persons throughout the United States qualified in occupational therapy and physiotherapy is very limited, and the impetus given this work by its marked success in the Army hospitals is such that the demand from physicians, civilian and industrial institutions, and State commissions is very great. This has placed the Government in active competition with private interests for the services of persons qualified in this work, and as the inducements offered elsewhere often exceeded those offered by the Government, it has been impossible fully to meet the demands of the stations for trained personnel.

This work is being done at 61 stations of the service, with a field force on June 30, 1921, consisting of 9 reconstruction officers, 4 special instructors in occupational therapy, 9 chief aides, 50 assistant chief aides, 29 head aides, 385 aides, 58 special male employees, and 12 pupil aides—a total of 556.

A marked advance has been made in the method of disposing of articles made in the course of occupational therapy. A supplement to Regulations Governing the Hospitals and Relief Stations of the United States Public Health Service was approved September 22, 1920, and provides that the service shall furnish material from which a patient may make two articles similar in value, of which one shall remain the property of the Government, the other be given to the patient. The articles belonging to the Government may then be sold at a price fixed by a board of appraisers. When these methods of disposal are perfected, it is believed that the receipts from the articles sold will, to a large extent, reimburse the Government for the expendable material for this activity. The number of patients treated in physiotherapy increased from 1,800 to over 4,000; in occupational therapy from 3,000 to 5,000. The treatments in

physiotherapy per week increased from 17,000 to 42,000, and the hours of work per week in occupational therapy increased from 30,000 to 53,000.

SECTION OF DENTISTRY.

The progress in the dental section has been very marked during this fiscal year. July 1, 1920, the section was supervising dental treatment for all Bureau of War Risk Insurance claimants, as well as the beneficiaries of the Public Health Service. Small clinics had been established in 29 hospitals, but the majority of dental treatment was rendered by dental examiners throughout the United States. At the beginning of this fiscal year very strict regulations were adopted, requiring that all claimants for dental treatment be certified by the Bureau of War Risk Insurance to receive same before treatment should be rendered. This necessitated a complete reorganization, and dental treatment to War Risk patients was reduced considerably, as more than 60 per cent of the applicants requesting dental treatment were refused as not having 10 per cent disability. This condition prevailed until April, 1921, when by order of the Secretary of the Treasury, certain administrative functions were transferred to the Bureau of War Risk Insurance and the dental examiners were taken over by that bureau at the same time. This left this section entirely free to devote its attention to the dental clinics which had been established. It was observed that about 60 per cent of the requests for dental treatment came from the large cities; hence it was deemed well to place large dental clinics operated by Public Health Service officers, so that the dental treatment rendered would be more uniform and satisfactory.

Additional dental equipment has been installed in the hospitals of the service until at the present time there are 61 dental clinics in operation. Out-patient dental clinics have been established in Philadelphia, Washington, D. C., Baltimore, Cincinnati, Chicago, St. Louis, Minneapolis, St. Paul, Denver, Seattle, Portland (Oreg.), San Francisco, and Los Angeles.

At the end of the fiscal year there were 181 officers on duty. These officers have been chosen with extreme care, and where unqualified dentists had been placed on duty, they were replaced by officers of the necessary experience and ability. Due to the fact that the equipment taken over from the Army was in a very deteriorated condition, it was found necessary to purchase new equipment for many stations, and as quite a saving could be made on complete dental outfits, the units were made uniform in equipment at all of the stations. The larger out-patient clinics are furnished dental surgery equipment in addition to the regular units.

It has been the earnest desire of this section to make the dental clinics of the Public Health Service modern institutions of their kind, and to have full equipment for the treatment of all conditions which properly fall within the province of the dentist. It has been clearly shown that dental treatment can be rendered in dental clinics at much smaller cost than through the medium of dental examiners, and the quality of treatment rendered is more satisfactory. In view of this fact, this section has planned for the establishment of additional clinics.

Oral hygienists are being used in many of the stations, and the result of their work has been so entirely satisfactory that endeavor will be made to have at least one oral hygienist placed in each clinic in the very near future. About 100,000 patients have received dental treatment during this fiscal year; 19,992 treatments were given during the month of June. This section does not have enough officers and equipment to meet the demands for dental treatment made upon it.

SECTION OF LABORATORIES.

X-RAY.

Two strikingly cogent problems underlie the successful operation of an X-ray section in this division; first, efficient administration, and second, adequate personnel.

The central problem is to supply medically proficient X-ray diagnoses with prompt dispatch at a minimum expenditure. The field of activity extends over the entire United States. The work naturally divides itself into that undertaken at established stations of the service, and that performed under individual contract with agencies coming under only superficial supervision.

There are 150 X-ray units operated by 90 officers and assistants, conducting an average of 30,000 exposures a month. Proper geographical distribution of the X-ray apparatus and operators and vigilant supervision of the activities are administrative resources that insure the provision of maximum service at minimum cost. Maximum service is initiated by the monthly circulation among stations of an efficiency rating based on the X-ray activities for that month. This element of competition yields activities that might otherwise lie dormant. This increased activity, by furnishing more value at practically the same expense, produces a minimum cost.

It has been observed that inactivity can usually be attributed to deficient skill incident to imperfect or incomplete training on the part of officers and particularly of assistants. The X-ray clinic in a dispensary at Washington is used as a training school for beginning X-ray appointees. A graded course of instructions is given in the methods of the service, and in the purpose and practice of X-ray technique. The experience of this school has been such as to justify the unqualified recommendation that there be instituted a regularly organized service center, furnished and equipped with the view to provide instruction for officers and assistants contemplating X-ray work. The school might be made a part of a larger organization, for instruction in other branches can be given with equal benefit to the service.

The X-ray service for the year has been marked less by expansion than by the development of available resources through the medium of helpful stimulation of provisional and technical endeavor for the purpose of dispatching a great duty, and measured by the standards of proficiency and efficiency.

LABORATORIES.

The organization of a laboratory section was well accomplished during the last fiscal year, and there have been few important changes

to record other than the usual expansion incident to the general expansion of the service. Although many laboratory workers in other branches of the Government service have been released, the proportion of particularly competent laboratory workers for this service still remains small, though the supply is not now critically short.

Two significant features dominate the laboratory service for the year; the first is the adoption, ubiquitously, in the division of uniform technique for the complement fixation test, the standard use being the hygienic laboratory modification. Since other divisions of this service may at times come into relation with the patients treated by the Hospital Division, it is manifest that unification of scientific methods will make for common medical understanding among all. Following this precedent, unification of all laboratories is one of the main issues that is gradually satisfactorily resolving itself. The second important advance has been the development of the research spirit in certain important sections of the country where service hospitals are located that admit of opportunity for observing usual medical phenomena. This spirit has been paramount in initiating the desire on the part of the laboratory officers and workers to keep abreast of important newly introduced scientific measures so that the established methods of blood chemistry, studies of basal metabolism, and similarly helpful modern laboratory technique have become daily routine at a great number of the service stations.

The laboratory in the dispensary at Washington is utilized as a training station for bacteriologists entering the service. Courses of instruction covering the important laboratory diagnostic methods are given, and the candidates assigned to hospitals where the laboratory work is of a character for which the applicant shows special adaptation. The variety and scope of the laboratory work has greatly increased, and the examinations given have increased from an average of 22,000 a month during the past fiscal year, to an average of 125,000 a month during this year.

SECTION OF NURSING.

The development of the work of this section, in the better organization of the nursing service with the recruiting, assignment and discipline of this very important personnel, has gone steadily forward during the fiscal year.

The cooperative arrangement with the American Red Cross concerning the supply of nurses has continued in force and been of great assistance, though the results have been materially different from those of last year, when practically all of the nurses appointed to the Public Health Service were recruited with the help of the American Red Cross. This year, on the contrary, of the 1,350 nurses appointed, 269 were recruited through the Red Cross and 1,081 through the office of the superintendent of nurses of this service.

The work has steadily increased in volume, and at the present time the staff of this section consists of one superintendent of nurses, one assistant superintendent, in Washington, one assistant superintendent, who spends occasional time in Washington but devotes most of her time to the field in the general supervision of nurses for neuro-psychiatric patients. Three additional assistant superintendents are assigned, one to the eastern, one to the middle, and one

to the western sections of the country for the purpose of supervising the nursing service in the various stations of the Hospital Division and also for the very important duty of recruiting nurses to fill the needs of the hospitals operated by this service. Many nurses have been assigned to the various dispensaries which have been established during the year and are performing a very efficient work in these places.

The problem of securing a sufficient number of suitable nurses for this work still remains great. This problem is greatly enhanced by the lack of legislation establishing a nursing service on a basis which would permit of better policies and more definite regulations regarding the government, compensation and other matters pertaining to this important part of the Hospital Division. The lack of this legislation affects the nursing service unfavorably, leaving, as it does, many grave uncertainties which intimately affect the personnel of this organization. Nothing would do more to stabilize this service than to base it on proper legislation.

The lack of a sufficient number of trained nurses for hospitals caring for tuberculous patients is a problem of importance. These hospitals are not infrequently located in isolated districts and the work is arduous and carries with it always a certain chance of infection unless the nurses are especially trained in this work.

In order to meet this condition, it is proposed to give training one month in work of this character in the hospital at Oteen, N. C., to chief nurses and head nurses who are engaged with tuberculous patients with the idea that these women, upon returning to their regular stations, may be able to disseminate the information and instruction which they have received. The contemplated course of instruction has been compiled by the superintendent of nurses of the Public Health Service, with the very valuable assistance of Miss Mary E. Marshall, of the National Tuberculosis Association, and Miss Alice Stewart, of the Pittsburgh Tuberculosis League; Miss Stewart having volunteered her service as an instructor for the period during which this school will operate.

The question of quarters for the nursing personnel is still unsatisfactory and in some places quite acute. The character of hospitals, which this service has been obliged to operate in many instances, makes the proper housing of this personnel difficult, if not impossible. The statistics showing the appointments which have been made to the nursing service and the resignations therefrom make it evident that the turnover in this personnel is far too great. This is believed to be due to the conditions under which these women are obliged to work. Their duties are arduous, satisfactory arrangements do not always exist to give them medical care when they become ill, legislation is not satisfactory to compensate them for injury or illness contracted in line of duty; the hours of work are somewhat long and the salaries are not entirely commensurate with the compensation which might be obtained from other sources. All of these factors contribute to dissatisfaction and unrest.

During the year, previous to the transfer of the district supervisors' offices to the Veterans' Bureau, a small force of nurses in a tentative manner was supplied to the headquarters of district No. 4, Washington, D. C., for the purpose of making contact with disabled ex-service

men and women. The same plan contemplated that these nurses should act very largely through local volunteer agencies of various kinds, they serving largely to make contact with these local agencies, who, in their turn, made contact with the individuals concerned. The plan proved very successful and much good was accomplished by getting into prompt contact with beneficiaries and seeing that they received the proper service and proper instructions regarding living conditions at their homes, and other important matters. This experiment was not continued by reason of the fact that the district supervisors' organization passed from under the control of the service.

During the continuance of the organization the following work was accomplished:

Number of visits made by United States Public Health Service nurses.....	3,226
Number of claimants actually interviewed by United States Public Health Service nurses.....	2,028
Number of visits made by nurses' cooperating agencies.....	342
Number of claimants actually interviewed by nurses of cooperating agencies.....	249
Number of claimants hospitalized due to visit of United States Public Health Service nurses.....	293
Number of cases in file.....	3,190

The acute shortage of nurses which has existed at times brought up for serious consideration the establishment of training schools for nurses. After careful consideration and preparation this matter finally took shape. A prospectus was issued and all arrangements completed to open training schools at United States Public Health Service Hospital No. 56, Fort McHenry, Md., and United States Public Health Service Hospital No. 61, Fox Hills, Staten Island, N. Y. Numerous applications have been made and it is believed this plan will prove successful. The places chosen were selected because there were adequate space and quarters for teaching, together with a trained personnel competent to conduct such a school.

One of the most encouraging features of the year is the increase in the general morale of the nursing service. As was noted in the last annual report there existed, not only among this personnel but among others, a general spirit of unrest and dissatisfaction. Great care has been taken throughout the year to foster "esprit de corps," and it is a matter of congratulation that these efforts have met with considerable success.

It is also encouraging to note that about one-fourth of the nurses who resigned, other than those resigning because of ill health or to be married, are making requests for reinstatement.

SECTION OF DIETETICS.

The work of this section includes varied activities which require considerable study, but which have undergone considerable development during the fiscal year. These activities include, among other things, the supply of efficient personnel; investigations concerning equipment; recommendations regarding standard diet tables; the study of data on nutrition and allied subjects together with markets and market conditions concerning food supplies; the distribution to the field force of pertinent information; the study of prices and economical methods in making purchases; the consideration of inspec-

tion reports from the various stations of the service and the supervision of records concerning the issuance of cooked rations and other matters pertaining to food and food supplies.

The dietitians on duty were nearly doubled during the year. The resignations were numerous enough to cause concern. There still exists some discontent among this force; although the spirit, like that of the nurses, is much better than it was last year. The same conditions described for the nursing service have been factors in the discontent, notably insufficient and unsatisfactory housing conditions.

Careful supervision has been maintained, through the inspection service and by other methods, over the activities of this section in the various hospitals of the service, and it is believed that it may be stated generally that the food supplied has been, on the whole, good. The general cost of the rations throughout the service has shown a steady decline along with the general decline in prices. It is believed that the cost of the rations may be further reduced, and every effort is now being made towards this end.

SECTION OF STATISTICS.

The work of the statistical section has been carried on along the same lines as in 1920.

The Nomenclature of Diseases and Conditions, which is to take the place of the one in use at the present time, is now in the hands of the printers, and will soon be ready for distribution.

In order to make patients' records and data derived therefrom available for purposes of the Bureau of War Risk Insurance and thus avoid duplication in the tabulation of Forms 1971-F, this section has organized the work connected with the records of War Risk Insurance patients to conform with the compensation and claims files of the Bureau of War Risk Insurance. This necessitated the entering and checking of C-numbers on all cards for War Risk Insurance patients. Upon the request of the assistant director, in charge of the Medical Division, Bureau of War Risk Insurance, a number of clerks have been assigned to do this work, some of which has to be performed in the Bureau of War Risk Insurance.

The data upon card Form 1971-F, showing admission of a patient, the class of beneficiary, hospital, permanent address, nativity, age, etc., are filed upon receipt. Upon disposition of the patient the record is completed, thus furnishing current information concerning the hospital population. This work is done by coding and punch cards.

The statistical tabulation of data relative to various activities of the service, and the production of charts based thereon has grown considerably during the year. The following routine reports have been maintained: Consolidated Weekly Census Report of Service Hospitals; Weekly Census Report Supplement (Classification of Beds and Patients by Districts); Monthly Table of Transactions at First Class and Other Relief Stations (Classified According to Beneficiary); Quarterly Combined Table and Chart of Patients in Service and Contract Hospitals and Empty Beds in Service Hospitals, by Districts; Semiannual Table and Chart of the Actual and Hypothetical Allotment of Personnel. Monthly Comparative Cost and Ration Cost Charts have been issued. Many of these routine reports and charts enjoy an extensive circulation. In addition to

the routine work about fifty special chart studies of the various activities of the service, organization charts, and spot maps have been produced.

MISCELLANEOUS.

There are numerous miscellaneous functions which have been carried on in the Hospital Division during the past year; these may be mentioned briefly:

The work reported last year under the maintenance accounts section has been transferred to the Division of Personnel and Accounts and a report of these activities will be made elsewhere.

The various inspection reports which are received from the field have been handled through a small unit so that they might receive prompt attention from the proper administrative officers. More than 600 such inspection reports and investigations have been thus handled.

The matter of supplies has been handled through cooperative arrangements with the purveying service, and the matter of inspection has been handled through similar arrangements with the general inspection service.

The acquirement of additional facilities and the consideration of sites offered have been handled through the advisory hospital committee, upon which there is a representative of the War Risk Insurance Bureau.

The question of medical libraries, as well as books supplied to patients, has been handled through an organization devoted to that purpose. An earnest attempt has been made to supply to every station of the service an adequate working medical library with a careful selection of the necessary books at a central office and encouragement to establish at every station a medical library where the doctors might assemble and discuss professional subjects and hold staff conferences. The work of supplying literature to patients, which has been done by the American Library Association, still continues, but in all likelihood arrangements will shortly have to be made to take this work over, in accordance with the desires of Congress.

Personnel matters have been handled through the Personnel Division of the bureau, but, of course, it has been necessary to maintain close cooperative arrangements.

Matters of office administration, clerical administration and instruction, general files, finance and law have all been handled through an agency of an executive clerk and are receiving their proper attention through various agencies established for this purpose.

SECTION OF ENGINEERING.

The title of this section was changed from construction section to engineering section early in the year.

The activities of the section have continued along the lines indicated in the last annual report. The work along the lines of acquisition, remodeling and enlarging of additional hospitals, besides specifying and recommending fixed equipment and material for ordinary maintenance repairs, has been quite extensive.

Progress has been made in the question of coordinating the functions of the engineering section as relating to those of the Supervis-

ing Architect, Treasury Department, along the lines indicated in the report of last year, to the extent that this section has undertaken no new permanent construction and has handled only a small amount of temporary construction, of which the most important is that at Tucson, Ariz. All new construction under Public Act 384, Sixty-sixth Congress, and certain remodeling of properties received from the War Department under section 2 of Public Act 326, Sixty-fifth Congress, have been handled by the Office of the Supervising Architect. The engineering section, however, has handled the acquisition by lease or otherwise, of many properties for use of the service, including 21 for and in connection with its hospitals and the necessary alteration and repair work on all temporarily occupied properties. This work has involved the expenditure of approximately \$2,225,000 from four appropriations, and has made available for service beneficiaries more than 4,000 beds. When work now in progress on these leased properties is completed more than 500 additional beds will have been provided. Four hospitals have been closed during the year; namely, Cape May, N. J.; Dansville, N. Y.; Hoboken, Pa.; and Markleton, Pa.

In addition to this work a great many miscellaneous matters have received very careful consideration, notably the question of the allocation of space for various purposes in the hospitals and stations of the service. This is a matter of considerable importance and requires a great deal of effort. Time has also been devoted to placing in better condition the files of this section with reference to the very valuable data which have been collected concerning the physical plants under operation by the Hospital Division.

The following is a list of the hospitals, additional to the list supplied in the last annual report, under the immediate control of the Public Health Service, as of June 30, 1921.

No.	Location.	Type.	Ultimate capacity June 30.	Ownership.
64	Camp Kearney, Calif.....	Tuberculosis	550	Land leased; buildings owned.
66	Carville, La.....	Leper.....	120	Land and buildings owned.
	Colfax, Iowa.....	General.....	183	Land and buildings leased.
	Excelsior Springs, Mo.....	Tuberculosis.....	200	Do.
	Fort McKenzie, Wyo.....	Neuro-psychiatric.....	400	Land and buildings owned.
61	Fox Hills, S. I., N. Y.....	General.....	1,077	Land leased; buildings owned.
67	Kansas City, Mo.....	do.....	125	Land and buildings leased.
68	Minneapolis, Minn.....	do.....	310	Do.
69	Newport, Ky.....	do.....	100	Do.
	Norfolk, Va.....	do.....	100	Land and buildings owned.
60	Oteen, N. C.....	Tuberculosis.....	856	Do.
	Portland, Oreg.....	General.....	200	Land and buildings leased.
65	St. Paul, Minn.....	do.....	290	Do.
59	Tacoma, Wash.....	Tuberculosis.....	244	Do.
	Walla Walla, Wash.....	do.....	150	Land and buildings owned.
71	Sterling Junction, Mass.....	General.....	58	Land and buildings leased.

DESCRIPTION OF HOSPITALS.

In giving a brief description of the hospitals which have been, and are being operated by the United States Public Health Service, the descriptions are arranged according to the numerical designation of the stations instead of by alphabetical arrangement.

UNITED STATES MARINE HOSPITAL NO. 1, BALTIMORE, MD.

The hospital is located on Remington and Wyman Avenues, near Druid Hill Park. The reservation contains 6 acres of land which is well sodded, and has an abundance of trees and shrubbery. The buildings, arranged in pavilion group, are wooden and brick structures heated by steam, lighted by electricity, and furnished with water from the city main. The buildings and grounds are owned by the Government. The hospital was opened March 21, 1887, and relief was furnished to sick and disabled seamen until the early part of this fiscal year, when the work was temporarily transferred to United States Public Health Service Hospital No. 56, formerly called Fort McHenry Hospital. This station can be remodeled and made a very excellent hospital for the Service.

UNITED STATES MARINE HOSPITAL NO. 2, BOSTON, MASS.

This station was first opened in 1804, and occupied two buildings previous to the present one, a brick and stone structure which was opened in 1860.

During this year very extensive construction and repair work has been done. Four new buildings were erected. The main hospital building was constructed, and a number of general repairs were made. The bed capacity has been practically doubled, and is now approximately 175 beds. The extensive alterations in the hospital building during the year somewhat checked the medical and surgical activities and made it necessary to reduce the number of patients, so that the total for the year has been comparatively low. It was necessary to discontinue surgical operations three or four months, and during this time all surgical cases needing operations were transferred to United States Public Health Service Hospital No. 36, known as Parker Hill Hospital.

Medical officer in charge, Ezra K. Sprague, surgeon.

UNITED STATES MARINE HOSPITAL NO. 3, BUFFALO, N. Y.

This is a general hospital with a capacity of 60 beds, and was opened in 1909. The buildings are constructed of plain brick with limestone trimmings. It is of block plan, consisting of an excellent basement, three stories, and a finished attic. The entire property is owned by the Government.

Medical officer in charge, T. C. Quick, surgeon (R).

UNITED STATES MARINE HOSPITAL NO. 4, CAIRO, ILL.

This hospital reservation is in the western part of the city on 4½ acres of land, made quite attractive with trees and shrubs. The hospital buildings, of pavilion group, are principally of brick structure. The reservation is inclosed by a substantial brick and cement wall. The hospital was opened to patients in March, 1886, and continued in operation until November, 1919, when it was temporarily closed because the demand for treatment did not justify the expense of operating the station, and the activities, therefore, were transferred to the marine hospitals at Evansville and St. Louis.

The plant is adequate for the ordinary needs of the service at this place, and when the river traffic is resumed to sufficient degree for the demand to justify maintaining this station, it can be opened at small expense.

UNITED STATES MARINE HOSPITAL NO. 5, CHICAGO, ILL.

The hospital is an imposing and handsome limestone structure of pavilion type, consisting of a central building of a basement and four stories, and two pavilions of three stories. The entire property is owned by the Government. This building was under construction at the time of the Chicago fire in 1871. At that time the patients were removed to the Mercy Hospital in Chicago, and cared for under contract until the completion of this building, November 17, 1873. From then until October 1, 1920, this station functioned as a general hospital with approximate capacity of 130 beds and with special arrangement for the hospitalization of tuberculosis cases on one floor. The character of the work was then changed from general to neuro-psychiatric. The tuberculosis cases were transferred to United States Public Health Service Hospital No. 30, and the former merchant seamen were retained in one ward of 25 beds. The other beds were immediately made available for the diagnosis and classification of nervous and mental cases.

This change in the character of the hospital necessitated a general rearrangement of the entire building and a number of changes in all departments. The remodeling is rapidly going forward and will be completed by November 11, 1921. Two huts were erected, one for the use of the Federal Board for Vocational Education, and the other for use of the out-patient department. Reconstruction of the main hospital building was begun on June 17, 1921. This reconstruction work has necessitated the temporary reduction of the hospital bed space by 34 beds. There are two other huts on the station besides those above mentioned—one is used for occupational therapy work, and the other for recreation.

Medical officer in charge, L. M. Wilbor, surgeon (R).

UNITED STATES MARINE HOSPITAL NO. 6, CLEVELAND, OHIO.

This hospital was first opened in 1852, and operated as a marine hospital until October 1, 1875, when it was leased to the Lakeside Hospital Corporation, until April 1, 1895, when this service again took charge. The hospital has a capacity of 86 beds.

The hospital building consists of three floors which accommodate the wards, administrative offices, and in addition quarters for some of the personnel. Some of the attendants are quartered in the main hospital while others are taken care of in the attendants' quarters, which is a small structure on the reservation.

During the past year a number of alterations were made which effected a decided improvement in the appearance of the hospital. The hospital was painted and rewired, the down spouts and gutters repaired, an X-ray room and a new boiler were installed, and various minor repairs were made.

Medical officer in charge, H. W. Wicks, surgeon.

UNITED STATES MARINE HOSPITAL NO. 7, DETROIT, MICH.

This hospital is located on a reservation approximately 240 feet wide by 700 feet deep. The reservation was ceded to the United States by act of the Legislature of the State of Michigan in 1853, and the hospital was completed and opened in 1857. Its present capacity is 80 beds, 77 of which are occupied. The main hospital building is a plain, substantial structure of red brick construction, and consists of three stories and a basement. There are several other buildings on the station used as quarters, heating plant, laundry, garage, etc.

A large amount of construction and repair work during the past year effected a great improvement in conditions at the hospital. Three portable houses were erected, an electric dumb-waiter, a new lavatory, and an electric chandelier were installed, and other alterations were made.

During the past fiscal year this hospital has been headquarters for all the Public Health Service activities at Detroit. Physical examination of War Risk claimants were conducted at this hospital until January 10, 1921, at which date that part of the personnel engaged exclusively in this duty was transferred to the offices at 113 State Street.

The increase in hospitalization incident to the care of ex-service men made it impossible for this hospital to meet the demands made upon it. Accordingly, it became necessary to enlist the aid of civilian establishments to take care of the overflow of patients, and contracts were made with eight local institutions for the fiscal year ended June 30, 1921.

Medical officer in charge, E. R. Marshall, surgeon.

UNITED STATES MARINE HOSPITAL NO. 8, EVANSVILLE, IND.

This hospital is a tuberculosis hospital, and is situated on a reservation covering an area of 10 acres. The building is a wooden structure of pavilion type, and was erected in 1891 and opened for the reception of patients on January 25, 1892. Though its normal capacity is 40 beds, there are at present 42 patients under treatment in the hospital.

Medical officer in charge, J. E. Weir, passed assistant surgeon (R).

UNITED STATES MARINE HOSPITAL NO. 9, FORT STANTON, N. MEX.

United States Marine Hospital No. 9 is on a reservation covering an area of 43 square miles and is located in south central New Mexico, 8 miles from the city of Capitan which is the nearest railroad point. The altitude is 6,231 feet. It is a tuberculosis hospital, and as such is exceptionally well situated, the climate conditions and environment being highly favorable to the treatment of tuberculosis. The hospital has a capacity of 261 beds.

There are 30 buildings on the station. The property was acquired by transfer from the Army in 1898. Since its acquisition, the stone and adobe buildings of the former Army post type were remodeled for sanatorium use, but no buildings of modern construction have been erected. The buildings are inadequate in number and arrange-

ment and in great numbers unsuited for sanatorium use. There is much to be desired by way of improving the buildings on the station.

This station differs from others in the service in that it operates a large cattle ranch and farm. This is necessary because of its location and in order to maintain a complete unit of operation. The farm department is not only a great asset to this station but has also been used as a supply station in breeding cattle for the United States Public Health Service hospital at Fort Bayard, N. Mex.

The most modern methods of treating tuberculosis are employed. The exceptionally good mess which is served here is a great asset to this institution and a necessary adjunct in the treatment of tuberculosis.

Medical officer in charge, M. D. Cohen, surgeon (R).

UNITED STATES MARINE HOSPITAL NO. 10, KEY WEST, FLA.

United States Marine Hospital No. 10 is a general hospital, and is situated on the shores of the harbor of Key West. The station occupies a plot of ground of about $1\frac{3}{4}$ acres. The main hospital building, consisting of a basement, two stories, and an attic, is a brick structure, and was erected in 1844. Other buildings on the station consist of the commanding officer's quarters, pharmacist's quarters, attendants' quarters, garage, carpenter's shop, morgue, isolation ward, store-room, and paint shop. Of these, the medical officers' quarters and the attendants' quarters are new buildings, having been erected in 1916. The hospital has a capacity of 45 beds, 36 of which are occupied at present.

Medical officer in charge, G. M. Guiteras, senior surgeon.

UNITED STATES MARINE HOSPITAL NO. 11, LOUISVILLE, KY.

United States Marine Hospital No. 11 was first opened in 1852. The main building consists of basement, two stories, and an attic; is of block type, constructed of brick, and is located on a 10-acre tract of land in a particularly clean and quiet part of the city. The city of Louisville is located geographically as a medical center and has a population of 275,000. This station is therefore called upon to do considerably more work than the size of the hospital can accommodate.

During the fiscal year 4,787 patients were either hospitalized, examined, or given out-patient treatment. Of these, 1,477 were hospital patients. The capacity of the hospital is 60 beds. The out-patient department, which had been conducted at the customhouse in previous years, has been operated at this hospital since July, 1920, due to the fact that the hospital was short of personnel.

Medical officer in charge, L. H. Redman, surgeon (R).

UNITED STATES MARINE HOSPITAL NO. 12, MEMPHIS, TENN.

United States Marine Hospital No. 12 is on a reservation covering about $4\frac{1}{2}$ acres, and is located $1\frac{1}{2}$ miles from the business section of the city of Memphis. The roads approaching the hospital from the city are in good condition. The grounds on the reservation are in

good condition and are protected from trespass by iron fencing on exposed sides. The reservation being just opposite De Soto Park, the patients have privilege of the same, which affords means of outdoor recreation, fresh air, and sunshine. The hospital was first opened in 1884. Present capacity is 85 beds. The buildings on the station are in a good state of preservation but, being old, require constant repairing and attention. The buildings consist of a pavilion group, made up of a central executive brick building, two stories and a basement, connected by corridor with two 1-story hard-brick base and wood superstructures and a 2-story brick building and basement. There also are a number of detached buildings used for various purposes, such as quarters, tuberculosis huts, recreation, storage, garage, etc.

During the past year the following new facilities have been added: Dental clinic, two-chair capacity; pathological laboratory; and X-ray laboratory. As this work was previously done on contract, the installation of these facilities have resulted in a great saving to the service. Other improvements during the year consist of addition of new equipment and painting exterior and interior of all buildings, except two portable structures which will be painted soon.

Medical officer in charge, James Brew, surgeon (R).

UNITED STATES MARINE HOSPITAL NO. 13, MOBILE, ALA.

United States Marine Hospital No. 13 is a cement-brick building, block type, three stories high, and is situated on a 3-acre reservation, inclosed by a brick wall. It was first opened in 1843. The capacity is 99 beds. In the rear is a disinfecting plant, a garage, morgue, and the isolation hospital. The latter building consists of one small ward and nurses' quarters.

This hospital has supervision over service beneficiaries treated in the city and Providence Infirmary and the contract hospitals. The leasing of the Southern Infirmary as an annex to this hospital will go into effect July 1, 1921, and will increase the bed capacity to 140 and will supply ample operating facilities which have been badly needed.

The hospital has been practically overcrowded during the entire year, and it has been necessary to utilize the porches in order to accommodate the patients sent here for hospitalization.

Medical officer in charge, J. T. Burkhalter, surgeon.

UNITED STATES MARINE HOSPITAL NO. 14, NEW ORLEANS, LA.

United States Marine Hospital No. 14 is located in the city of New Orleans, about 4 miles from the center of the city. It occupies approximately 4 square blocks. The reservation is surrounded by a brick wall on three sides, and is inclosed on the fourth side by an iron fence. The hospital has occupied this site since about 1885. The present capacity is 358 beds.

During the past year there has been a great increase in the work performed in all departments of the hospital. The number of patients treated has continually increased. In July, 1920, there were approximately 249 patients; on July 1, 1921, there were 320. The

hospital has been crowded at nearly all times. A number of changes and additions to buildings have also taken place during the year.

Medical officer in charge, R. E. Ebersole, surgeon.

UNITED STATES MARINE HOSPITAL NO. 15, PITTSBURGH, PA.

This hospital is located near the old Arsenal Reservation. A marine hospital was opened in 1851. The present building was completed July 31, 1909. This station unit comprises five buildings; part are of brick, and part are wooden structures. The grounds are well drained and sodded, and are surrounded by a stone fence.

The hospital proper is a 4-story pressed-brick structure. The basement is used for storage purposes, and a boiler room. A 1-story brick structure to the rear of the hospital is used for garage, and occupational therapy department.

The out-patient building and Red Cross Hut have been erected within the past year. The isolation of some of these units tends to relieve the congestion of work in the hospital. The Government owns the buildings and grounds.

Medical officer in charge, H. B. Fralic, surgeon (R).

UNITED STATES MARINE HOSPITAL NO. 16, PORTLAND, ME.

United States Marine Hospital No. 16 was first opened in 1852. The station grounds consist of about 20 acres, almost surrounded by salt water. There is good natural drainage and quite a number of forest trees are present. The situation and condition of the grounds favor recreation and comfort in the summer. The buildings on the station consist of one main brick building with a capacity of 40 beds, one isolation hospital with 6 beds, one power house and one work shop, one recreation building (portable), one ice house and a garage.

A number of new facilities were provided during the fiscal year, including an X-ray room, sterilizing room, sky light for operating room, and tile floor for kitchen.

Medical officer in charge, R. L. Wilson, surgeon.

UNITED STATES MARINE HOSPITAL NO. 17, PORT TOWNSEND, WASH.

This hospital reservation is located in the southeastern part of the city, overlooking the waters of the straits of Juan de Fuca. The present 4-story frame building, with a basement of brick structure, is located on $2\frac{1}{4}$ acres of ground. It was opened to patients January 29, 1896.

The grounds are well turfed and have an abundance of trees and shrubs of various kinds. The plot is partially inclosed by a picket fence, making the grounds an excellent place for recreation for ambulatory patients. The site is ideal for hospital grounds and is also at an important shipping point on the Sound. It is recommended that more space be given the reconstruction department and that the portable house on the grounds be erected at once, as the various clubs of Seattle will furnish it. This property belongs to the Government.

Medical officer in charge, Emil Krulish, surgeon.

UNITED STATES MARINE HOSPITAL NO. 18, ST. LOUIS, MO.

This station is located in southern St. Louis, overlooking the right bank of the Mississippi River, on a reservation comprising 17 acres of land which is practically level and of good altitude. A marine hospital was built of brick in 1855. It was used during the Civil War for a military hospital and later for a marine hospital, until 1876, when it was abandoned for sanitary reasons.

The present executive building, a red brick, 3-story structure, was completed and occupied February 15, 1882. A new frame building has been lately completed for occupational therapy, also a new steam laundry, and extensive painting and renovating of all buildings.

At present there is urgent need of converting the ward porches on hand into sleeping porches, for which plans have been drawn.

Medical officer in charge, L. P. H. Bahrenburg, surgeon.

UNITED STATES MARINE HOSPITAL NO. 19, SAN FRANCISCO, CALIF.

This hospital is located on the west bank of Mountain Lake, near the Presidio, on a reservation of about 86 acres of well-kept land, made attractive with flowers and trees. This hospital, which is a pavilion group of wooden structure, cottage type, clapboard first story, was first occupied in June, 1875. The equipment is sufficient and up to date, but the work is hampered by lack of room. The hospital is capable of doing any class of work except laboratory.

There is vital need of several new buildings. The matériel officer has property stored in six different buildings. A great deal of money is now being spent patching up old buildings, instead of in erecting new ones. The property is owned by the Government.

Medical officer in charge, L. L. Williams, assistant surgeon general.

UNITED STATES MARINE HOSPITAL NO. 20, SAVANNAH, GA.

This hospital is a brick structure, consisting of three stories, basement, and an attic. It is built in mission style, with porches on the first and second stories, and is located on a plot of land six-tenths of an acre in area.

This hospital was opened to patients November 1, 1906, and is still in an excellent state of preservation. The nurses' quarters are in a leased building near the hospital. This station has outgrown its present capacity, and an effort should be renewed to enlarge or rebuild it, and it should be reclassified. Buildings and grounds are owned by the Government.

Medical officer in charge, G. V. Johnson, surgeon (R).

UNITED STATES MARINE HOSPITAL NO. 21, STAPLETON, N. Y.

This hospital, a fine old building of colonial architecture, consisting of four stories and a basement, is located near the center of the reservation, which has an area of about 9 acres, overlooking the entrance to New York Harbor.

The station was opened about the year 1883, and has now a normal capacity of about 295 beds. The grounds have been planted with flowers, grass and trees, and are protected on the south boundary by

a 7-foot iron fence. A new laundry has been constructed; also a new building of reinforced concrete tile and stucco structure is completed to be used for the new power plant and designed to serve as kitchen and dining room. The new ice plant and elevators are nearing completion, but have not yet been accepted from the contractors. Both buildings and grounds are owned by the Government.

Medical officer in charge, G. B. Young, senior surgeon.

UNITED STATES MARINE HOSPITAL NO. 22, VINEYARD HAVEN, MASS.

United States Marine Hospital No. 22 is a general hospital with a capacity of 24 beds, and was first opened in 1879. The reservation contains about 5 acres and the buildings are all wooden structures. The property is all owned by the Government, and is well located for a service hospital.

During the past year a number of improvements were made, such as the repainting of buildings, reconstruction of fences, construction of new doors for main building and for attendants' quarters, and leveling of floor.

Medical officer in charge, H. S. Mathewson, surgeon.

UNITED STATES MARINE HOSPITAL NO. 23, WILMINGTON, N. C.

The marine hospital reservation, consisting of 18½ acres of land, is located in the eastern part of the city of Wilmington, N. C., and inclosed partly by iron and partly by wire fencing. It was opened to patients May 18, 1881.

The buildings consist of brick and wooden structures, and should be replaced with more modern structures when it becomes possible to reopen the hospital, which has been closed for some time.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 24, PALO ALTO, CALIF.

This station formerly constituted the base hospital of Camp Fremont and was acquired by transfer from the War Department. It was opened as a Public Health Service hospital on April 2, 1919. The reservation covers an area of 90 acres and is located 2½ miles northwest of Palo Alto. Both land and buildings are owned by the Government. The hospital is operated as a tuberculosis sanatorium and has a capacity of 570 beds.

The grounds on the station present a strikingly beautiful appearance, due to the location, splendid climate, and the good care that is taken of them. The station consists of 46 temporary wooden buildings of one-story construction and 6 of similar construction, two stories high. These buildings rest on concrete piers from one to two feet above ground, giving free air circulation underneath. During the past year the entire plant was reroofed, wire screening was supplied for the major portion of the hospital, and interior and exterior painting is now in progress.

Surg. J. M. Wheate (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 25, HOUSTON, TEX.

This station formerly constituted a part of Camp Logan and was acquired by transfer from the War Department on July 1, 1919. The reservation covers 200 acres and is elevated about 70 feet above sea level. The climate is subtropical and almost insular in character. The buildings are wooden structures on concrete pillars, with tarpaper roofs. At the beginning of this year they were unpainted and in a very dilapidated condition. Most of them were uninhabitable because of leaky roofs. During this year, all buildings have been painted, all openings screened, all roofing has been repaired and given a coat of asphalt paint, and numerous other repairs have been made, so that they are now in fair condition. At the beginning of the year only about two-thirds of the buildings were in actual use. Now, all are being used, this having been made necessary by the great increase in patients. Present capacity of the hospital is 1,015 beds. Similar extensive improvements had to be made to the grounds on the station, which were in a very poor condition. Previous to this year the grounds north of the main road were neglected and presented a very unsightly appearance. This condition has been greatly improved and the transformation of part of this section into golf links and a ball diamond has added much to the appearance. The grounds in the vicinity of the hospital are well kept. South of the buildings and garden the undergrowth is being gradually cut away, which improves the appearance and to some extent removes the mosquito harbor farther from the wards. Constant attention to draining, oiling, and screening has reduced the mosquito menace to a negligible consideration. The entire area has been ditched within the past year. All main roads have been resurfaced.

Surg. M. H. Axline (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 26, GREENVILLE, S. C.

United States Public Health Service Hospital No. 26 is on a reservation covering 274.02 acres and is located 5 miles from Greenville, S. C. The elevation is 1,200 feet. The property, which was formerly known as Camp Sevier, was acquired by transfer from the War Department and opened as a Public Health Service tuberculosis hospital on April 5, 1919. Present capacity is 654 beds, and 160 additional beds will be made available soon.

The hospital buildings are of wood and beaver-board construction, with composition slate roofing, except covered walks, the roofs of which are covered with roofing paper. During the past year, there was a considerable amount of construction completed and extraordinary repairs made at a total expenditure of \$123,752.43. This included the construction of a number of cottages and an ice storage building, the installation of a solarium and heating facilities in a number of buildings, and various extensions and remodeling of wards, buildings, etc. The grounds have been greatly beautified. Land covered by the ruins of officers' quarters was converted into a park, 190 by 400 feet.

There has been a general and progressive improvement in organization, efficiency and morale, both of personnel and patients.

Courses of instruction have been conducted at this hospital for medical officers, and the results have been entirely satisfactory. A general atmosphere of contentment prevails.

Senior Surg. J. E. Dedman (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 27, ALEXANDRIA,
LA.

The hospital reservation consists of approximately 480 acres of land and is located 4 miles from the city of Alexandria. The land is owned by the State of Louisiana and was granted to the Federal Government by act of the State legislature. The Government has the use of the land as long as it elects to use it for hospital purposes.

The buildings on this station, 60 in number, formerly constituted the base hospital of Camp Beauregard. It was opened as a Public Health Service hospital in April, 1919. All buildings are of single-story construction, except the Red Cross house and eight buildings of the two-story Army barracks type. As the result of a fire which occurred November 13, 1920, some loss to property was occasioned and new construction had to be undertaken to replace it. Thus, the construction of a main kitchen, diet kitchen, mess hall, refrigerating plant, milk reconstruction plant and various appurtenances thereto was approved by the bureau and at the present writing this construction is about 38 per cent complete. Other contemplated construction consists of a central heating plant, new incinerator, station laundry, 3 new wards, recreation hut for colored patients, open-air pavilion for white patients, and an officers' clubhouse.

Though classified as a tuberculosis hospital, all classes of patients are admitted, so that the hospital functions largely as a general hospital, with tuberculosis cases predominating. Present capacity is 630 beds.

Adequate social activities at the station are conducted under the auspices of the Red Cross, Knights of Columbus, and various local organizations. One feature of this phase of hospital activity is the publication of a monthly hospital paper by the patients themselves.

Surg. W. K. Baldwin (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 28, DANSVILLE, N. Y.

Public Health Service Hospital No. 28, formerly known as Jackson health resort, was leased by the War Department about April 21, 1918, and under date of June 26, 1919, the Public Health Service entered into an agreement with the president of the Jackson Sanatorium for the rental of the premises to be effective July 1, 1919, to run for a period of one year ending June 30, 1920.

The premises comprised about 40 acres of land with a number of buildings scattered over the area.

The hospital was utilized by the Public Health Service for the treatment of mental cases, and the owner was notified under date of August 6, 1920, that the Government would vacate the premises effective September 20, 1920, but final relinquishment was not made until November 30, 1920.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 29, NORFOLK, VA.

United States Public Health Service Hospital No. 29 is situated on Sewells Point, about 7 miles from Norfolk. This hospital was transferred from the War Department to the Public Health Service May 27, 1919, and opened June 2, 1919. Many improvements have been made both to buildings and grounds. A large portion of the land formerly included in the hospital reservation was turned over to the Norfolk Country Club and is being used as a golf course. In this way the hospital view has been improved. The buildings are of the usual base hospital construction, temporary in character and rapidly deteriorating, thereby necessitating repairs. The bed capacity is 300. A new hospital is now under construction at the Tanners Creek site under supervision of the Supervising Architect's office. It will have a capacity of about 100 beds and will be ready for occupancy in the spring of 1922.

Passed Asst. Surg. L. E. Hooper, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 30, CHICAGO, ILL.

Public Health Service Hospital No. 30 is located on Drexel Boulevard and was formerly known as United States Army Base Hospital No. 32. It was acquired by transfer from the War Department and opened as a Public Health Service hospital on June 13, 1919. The building is an L-shaped, reinforced concrete structure with red brick facing and freestone trim. It rises seven stories above ground and has a basement and subbasement. There are three large wards in the hospital, 17 smaller wards and 70 rooms for the treatment of patients, giving a total capacity of 550 beds. In case of emergency, however, the capacity could be increased by 20 extra beds. Because of the method of construction and shape of the building, ventilation by natural methods (induction, perfilation, etc.), is excellent, and forced ventilation is unnecessary in wards and rooms but is used in the toilets, bathrooms, and kitchens.

On October 1, 1920, the hospital acquired control of the first-aid station at the Federal Building. This station is used only for the treatment of Employees' Compensation Commission and emergency cases. By means of this change congestion at the hospital was relieved and many postal employees who would otherwise report to the hospital are now treated at the first-aid station.

Passed Asst. Surg. R. H. Heterick, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 31, CORPUS CHRISTI, TEX.

This property was known as the Corpus Beach Hotel. It was transferred from the Army to the Public Health Service May 31, 1919, and the Public Health Service purchased it June 7, 1920. It was badly wrecked by a hurricane September 14, 1919, and has not been occupied since that date.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 32, WASHINGTON,
D. C.

This hospital is located on Wisconsin Avenue and Twenty-sixth Street, Washington, D. C. The property was first leased by the Public Health Service in July, 1919, and purchased in July, 1920, for \$460,000. The Government has made a great many alterations and extensions to the property. The hospital has a bed capacity of about 170. Eleven acres of land belong to this property.

Passed Asst. Surg. S. L. Christian, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 33, JACKSONVILLE,
FLA.

Public Health Service Hospital No. 33 was, prior to its acquisition by the Public Health Service, utilized by the Army as a general hospital.

The property was leased by the War Department under oral agreement with the Jacksonville Chamber of Commerce, and the land occupied by the Army consisted of 656 acres of Government land, 317 acres of State land and 2,000 acres of land which belonged to private parties. The Public Health Service did not occupy all of the land above mentioned but confined its activities within the hospital area, which only covered a small portion of the total area. The Public Health Service utilized this property in accordance with public act 326, section 2, which was approved March 3, 1919.

The Secretary of the Treasury approved the transfer of patients from the Jacksonville hospital to other hospitals under the control of the Public Health Service under date of October 4, 1919, and very shortly after that date the salvage operations in dismantling buildings and equipment was commenced. Salvage operations were practically completed as of July 1, 1921. There remained on the premises at that time a small amount of lumber, etc., which was considered unserviceable and will be disposed of in the usual manner.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 34, EAST NORFOLK,
MASS.

United States Public Health Service Hospital No. 34 is a neuro-psychiatric hospital with a capacity of 230 beds. The property was formerly known as the Norfolk State Hospital and was leased from the State of Massachusetts under date of July 1, 1919.

The hospital is divided into two groups of buildings, approximately 3 miles apart. The administration of affairs at this station is therefore made more difficult. The group of buildings known as the oval has been maintained entirely for the work of the Federal Board for Vocational Education in order to establish the feasibility of training of neuro-psychiatric patients under the Federal Board. From 30 to 45 patients have been under treatment there daily throughout the year. The main group of buildings is provided with a highly efficient central heating plant which supplies hot and cold water and steam for heating and operating machinery, including the laundry, electrical power plant, refrigerating system and ice

plant. Fourteen different buildings draw upon this plant for hot and cold water and steam. At the oval group of buildings, however, there is no central heating plant, each building having its separate heating unit and hot water supply.

This station has a farm department in charge of a farmer and two laborers. Six acres are under cultivation at the present time. During the past year, the following crops were realized: Fifty-five tons hay; 287 bushels potatoes; $3\frac{1}{4}$ tons cabbage.

Passed Asst. Surg. William A. Ellison (R), medical officer in charge (temporary).

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 35, ST. LOUIS, MO.

This station was transferred from the Army to the Public Health Service on July 1, 1919, and formerly constituted Army General Hospital No. 40. The property was originally known as the city infirmary, but the War Department secured the land, buildings and equipment from the city of St. Louis on a 5-year lease, under date of November 15, 1918.

The property includes approximately 20 acres of ground on which are located eight fairly fireproof brick buildings used for wards and offices, one stone one-story power house and 10 frame buildings and sheds used for storage, garages, stables, etc. In addition, three portable buildings have been erected during the year for use as occupational therapy shops, school rooms for Federal Board for Vocational Education, and a small gymnasium. As the original buildings were never intended for use as a hospital, they lack many facilities ordinarily considered essential for such an institution; nevertheless, the plant has been utilized to excellent advantage and hospital service of a very high grade furnished in spite of the disadvantages present. The capacity of the hospital is 650 beds, 621 of which are occupied at the present time.

On February 14, 1921, the out-patient office, which had long been maintained at the old customhouse, Third and Olive Streets, was removed to the third floor of the Republic Building at Olive and Seventh Streets. The new quarters are far more convenient and are well arranged to care for a larger number of applicants with a minimum of delay and a maximum of facilities.

Surg. L. P. H. Bahrenburg, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 36, BOSTON, MASS.

This hospital is located in Parker Hill, Boston, Mass., and was acquired by transfer of lease from the War Department. It was opened as a Public Health Service hospital on July 1, 1919. Present capacity is 508 beds.

The buildings are owned by the Robert Brigham estate, Massachusetts Women's Hospital, and one building was donated by the Benevolent Protective Order of Elks in 1917. These buildings have been leased for another year ending July 1, 1922. The Robert Brigham Hospital comprises the administrative building in which are located most of the administrative offices, and also four wards. The Elks hospital building is of cement and stucco finish, is two stories high and has nine wards. Since the last annual report there has been

only one addition in buildings to the station, that being a single house adjacent to the women's hospital which was taken over on September 1, 1920, as additional quarters for nurses.

The station has a large power plant which furnishes heat and light to all the buildings except the nurses' quarters, which is maintained separately. The plant is connected by trunk lines with the Edison circuit and in cases of breakdown it can still be operated.

Surg. R. W. Browne (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 37,
WAUKESHA, WIS.

United States Public Hospital Service Hospital No. 37 was formerly known as the Rest Haven Sanitarium, and was acquired by purchase under date of April 3, 1919. The property thus purchased was increased by another small purchase of adjacent private property under date of June 12, 1920. The reservation covers slightly less than 6 acres of land and presents an agreeable and pleasing appearance. Having formerly been occupied as a combined sanitarium and hotel, the hospital building was well adapted to conversion into a hospital for nervous cases. It was opened as a Public Health Service hospital in July, 1919. The main building is Y shaped and consists of three wings and a central portion, together with a large solarium between the two forks of the Y. The wards and rooms are well lighted and ventilated and have a capacity of 200 beds. At the present time the hospital is operating above normal capacity, having 205 patients hospitalized. In a short time 100 additional beds will be made available.

The only accessory buildings at this station are: Quarters of medical officer in charge; two portable houses; and one temporary garage. The hospital manufactures its own light and power.

Surg. Lawrence Kolb, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 38,
NEW YORK CITY, N. Y.

United States Public Health Service Hospital No. 38 was formerly known as Polyclinic Hospital and was acquired by transfer from the War Department under date of August 5, 1919. It was opened as a Public Health Service hospital on August 15, 1919. The Public Health Service operated the hospital under the Army lease until June 30, 1920, and then exercised option in renewing the lease.

The hospital is an 11-story, fireproof structure, and has a capacity of 270 beds, 251 of which are occupied at the present time.

During the past year many alterations and repairs were made, including the cleansing and painting of practically the whole hospital building, and the renovation of the seven outbuildings located on either side of the hospital and in the rear.

Passed Asst. Surg. W. D. Heaton, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 39,
HOBOKEN, PA.

United States Public Health Service Hospital No. 39 was closed as of October 1, 1920, and temporary buildings and service equip-

ment salvaged and shipped to other hospitals for use of the Public Health Service.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 40,
CAPE MAY, N. J.

Public Health Service Hospital No. 40 was formerly known as United States Naval Hospital, Wissahickon Barracks, and utilized by the Navy Department for a hospital. This property was locally known as Physsick farm, and located in the county of Cape May in the State of New Jersey.

The Secretary of the Navy transferred to the Public Health Service the premises referred to herein under the date of July 29, 1919, which was in accordance with section 3, Public Act 326, approved March 3, 1919. The premises were utilized by the Public Health Service for the treatment of mental cases.

The owners of this property, on January 31, 1921, advised the Public Health Service that they desired to obtain possession of the farm at the earliest possible moment, and in view of the above the Secretary, under date of August 6, 1921, approved of the transfer of patients from Cape May to Perryville, Md. Under date of December 15, 1920, funds were allotted for the commencement of salvage operations, and the work of salvaging buildings and placing the premises in good condition are nearly completed.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 41,
NEW HAVEN, CONN.

United States Public Health Service Hospital No. 41 is a tuberculosis hospital. The property, which was formerly operated as an Army hospital, was transferred to the Public Health Service under date of September 12, 1919, and was operated for a time under the Army lease. Under date of May 24, 1920, a new contract with the General Hospital Society of Connecticut was approved, by which the property was leased to the Public Health Service. The hospital is a brick structure and has a capacity of 500 beds.

Passed Asst. Surg. J. R. Ridlon, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 42,
PERRYVILLE, MD.

This station was formerly known as the ammonia nitrate plant and was transferred (land, buildings, and fixtures) to the Public Health Service from the War Department under date of October 1, 1919. The reservation covers about 516 acres of land, of which the village and hospital grounds comprise practically one-third; the area occupied by the power plant and supply depot, one-fifth; and the remainder is divided equally between farm and woodland. On the reservation there are about 200 wooden houses for the housing of personnel and the accommodation of patients. The hospital is a neuro-psychiatric hospital and has a capacity of 430 beds.

The activities at this station are divided under three main headings: Supply depot, hospital, and custody of buildings and grounds, the latter including regulations governing the health and conduct of

personnel and residents on the reservation, supervision of recreation, amusement facilities, coordination of work of the Federal Board for Vocational Education with other activities, and certain miscellaneous activities.

On September 28, 1920, the Public Health Service hospital at Cape May, N. J., was transferred to this station.

Passed Asst. Surg. J. G. Wilson, medical officer in charge of reservation; Surg. E. H. Mullan, medical officer in charge of hospital; Associate Medical Purveyor C. H. Bierman, in charge of supply depot.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 43,
ELLIS ISLAND, N. Y.

This hospital forms a portion of the Federal immigration station at New York and is operated under an agreement with the Bureau of Immigration dated September 1, 1919. The hospital has a capacity of 650 beds and is divided into two groups, the general hospital group being located on island No. 2, and the contagious hospital on island No. 3. The buildings are brick structures. The station is operated almost entirely for the care and treatment of alien immigrants.

Surg. J. W. Kerr, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 44,
WEST ROXBURY, MASS.

This station was formerly part of the Boston city hospital, and during the war was used by the United States Army as a convalescent hospital. It was acquired by the Public Health Service on November 8, 1919, and opened December 1, 1919. The land and buildings are leased from the city of Boston.

The reservation covers approximately 31 acres, 14 of which are not suitable for use, being quite low, in part covered with brushes, and at certain seasons of the year is inundated. Having been neglected for a number of years, the land is in a much wasted condition. The land is quite rolling and, excluding the swamps, is quite well drained. Allotment has been made by the bureau for the draining of the swampy areas.

The hospital is a neuro-psychiatric hospital and consists of about 17 buildings with a capacity of 237 beds, 229 of which are occupied at the present time. Sixty-three additional beds will soon be made available. The work of repairing and cleaning up the buildings and grounds has progressed gradually so that the station is in a fairly good condition.

Senior Surg. A. P. Chronquest (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 45, BILTMORE, N. C.

United States Public Health Service Hospital No. 45, formerly known as Kenilworth Inn, was acquired by lease and was opened as a Public Health Service hospital on December 6, 1919. The location and natural surroundings of the station are particularly attractive. The reservation covers 60 acres of beautifully wooded land, 2,200 feet.

above sea level, and has a most salubrious climate. The buildings consist of one main hospital building, a recreation building, a garage, a building for the Federal Board for Vocational Education, and 18 cottages used as quarters for medical officers, nurses, and aides. The institution is practically a hospital of private rooms. In each room is a lavatory and between every two rooms is a tiled bathroom. The beauty and equipment of the station is reflected in the deep satisfaction on the part of patients and personnel. Present capacity is 388 beds. It is the intention of the Public Health Service to relinquish this property in July, 1922.

Surg. M. H. Foster, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 46, DEMING, N. MEX.

This property was formerly known as Camp Cody and is not at the present time being utilized as a hospital, although a caretaker is on the premises in charge of the buildings. A large number of temporary structures at Deming have been salvaged and the material shipped to various Public Health Service hospitals for use in buildings to be erected at such points.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 47,
MARKLETON, PA.

This property was acquired by lease from the Markleton Hotel Co., and has been closed and service property removed.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 48, ATLANTA, GA.

This station is located 10 miles from Atlanta, Ga., and has 21 acres. The property, formerly known as the Chester King Sanitarium, was purchased by the Public Health Service on May 3, 1920, though it had been operated as a Public Health Service hospital since February 2, 1920.

The hospital is a two-story brick building having two wings and four wards. When first acquired, the building contained only private rooms; now there are spacious, well-lighted and well-ventilated wards, having a capacity of 100 beds. The hospital is also well equipped. The plan of construction is unique. It is in the form of a square, with the kitchen, engine room, and heating system in the apex which is connected with the wards by two galleries. With this plan, all odors, etc., from the kitchen are not noticed in the hospital proper.

Surg. William Clinton Sheehy (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 49,
PHILADELPHIA, PA.

United States Public Health Service Hospital No. 49 is located at Philadelphia, Pa. This property was formerly occupied by the Navy and was transferred to the Public Health Service under date of February 1, 1920. The Public Health Service has made extensive alterations and improvements to the buildings. The capacity of the hospital is 450 beds, and it was opened for the reception of patients

on August 12, 1920. To convert this hospital into a neuro-psychiatric hospital from a general hospital, required the grilling of windows, alterations of electrical equipment, and putting in many new partitions to provide more rooms. The approximate cost of these repairs and alterations was \$100,000. The interior of the building has been painted throughout. When United States Public Health Service Hospital No. 39 at Hoboken, Pa., was closed the patients were transferred to this station.

Senior Surg. O. C. Willhite (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 50,
PRESCOTT, ARIZ.

United States Public Health Service Hospital No. 50 (Whipple Barracks) is Government-owned property, formerly under the control of the War Department and now loaned to the Public Health Service. It is to be enlarged in accordance with the approval of the board of consultants on hospitalization from funds appropriated under Public Act 384. The work is under the immediate control of the office of the Supervising Architect. This institution is for the care of tubercular patients and has a bed capacity of 765. The work above mentioned will increase the capacity by about 400.

Surg. R. H. Stanley (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 51, TUCSON, ARIZ.

United States Public Health Service Hospital No. 51 is a tuberculosis hospital. The property was formerly known as Pastime Park, and was leased (both land and buildings) from its private owner on December 20, 1919. The station covers an area of twenty-five acres and is approximately $3\frac{1}{2}$ miles from the city of Tucson. In February, 1920, a contract amounting to \$10,700 was let for the installation of a sewerage system and remodeling of buildings. Construction and repair work immediately began and on March 15, 1920, the hospital was opened to the reception of patients. The capacity of the hospital at that time was 64 beds. The patients gradually grew in number until by September, 1920, the hospital had 128 patients, although the capacity was still 64 beds. This necessitated housing the patients in tents secured from the Army at Nogales, Ariz. In December, however, an appropriation of \$262,000 was made for increasing the capacity of this hospital. Construction was begun on December 6 and rapidly pushed to completion. All work was completed in the early part of February, 1921. The new construction consisted, in part, of the building of 50 cottages, each accommodating four patients. Numerous repairs and alterations were made. The present capacity of the hospital is 320 beds.

Acting Asst. Surg. N. D. MacArtan, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 52, BOISE, IDAHO.

This station was formerly a United States Cavalry post (Boise Barracks) and was acquired by transfer from the War Department on November 20, 1919. The entire reservation consists of about eleven sections of land (7,040 acres), of which 638 acres are used

as the station reservation. It is mostly flat level bottom land with a small section of higher hilly ground. The elevation is approximately 2,600 feet. A little over one-third of the land is leased to the State of Idaho for the use of the militia. There are 29 wooden buildings on the hospital reservation. The station has its own water-supply system, consisting of about 35 miles of pipe of various sizes and descriptions, and 120 springs and seepages.

The hospital opened in April, 1920, with a capacity of 30 beds. From time to time, as activities increased and other buildings were opened up, the capacity of the hospital was increased, so that on June 30, 1921, 200 beds were available.

Surg. W. H. Allen (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 53, DWIGHT, ILL.

United States Public Health Service Hospital No. 53 was formerly known as the Keeley Institute. The property was leased by the Public Health Service from the Leslie E. Keeley Co. under date of March 1, 1920, and was opened as a Public Health Service hospital on June 4, 1920. It is a general hospital with a capacity of 165 beds.

The buildings are practically fireproof. Building No. 1 is designated as the main hospital building, No. 2, the administration building, and building No. 3 is designated as the power building. Just opposite the main hospital building is a two-story brick structure used as a nurses' home. This was opened on February 15, 1921.

Work on extensive alterations will be resumed shortly, which, upon completion, will increase the present capacity of 165 beds to approximately 240, and also give adequate space to the physiotherapy and occupational therapy departments, and the station Red Cross.

Surg. P. G. Lasche (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 54, ARROWHEAD SPRINGS, CALIF.

This hospital is located in southern California. The property was formerly utilized as a hotel, and was leased from the Arrowhead Springs Co. under date of February 9, 1920, with renewal privileges until after June 30, 1924. It was opened as a Public Health Service hospital on June 15, 1920. Present capacity is 118 beds.

The reservation has over 1,800 acres, with gardens, farm, private water system, etc. It is contemplated to greatly increase the bed capacity. The bed capacity can be increased threefold at very little extra expense. The farm and gardens produce 60 per cent of all fresh vegetables and 20 per cent of all fruits consumed at the station. All fresh pork consumed at the station is furnished from the farm.

For construction and repairs during the year there was expended the sum of \$108,000. A new laundry building was constructed and new machinery installed. This resulted in a great saving to the service as work formerly sent to a commercial laundry in the city is now being done here at a greatly reduced cost. A 75-horsepower boiler was installed. Also, two large septic tanks have been installed

to take care of the sewage, which, after it leaves these tanks, irrigates one of the gardens. Completion of the hydrotherapy building is contemplated.

Passed Asst. Surg. R. L. Allen, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 55, FORT BAYARD,
N. MEX.

This hospital is the largest tuberculosis hospital under the supervision of the United States, having a capacity of 1,000 beds. It is located at an altitude of 6,165 feet in the extreme southwestern part of New Mexico, and is isolated on the Rocky Mountain Plateau, 135 miles from El Paso, Tex., and 750 miles from Los Angeles, Calif. There is no town of any size in the vicinity of the hospital. The climate is salubrious and is equable throughout the year. The sanatorium proper covers 200 acres and consists of 302 buildings. The property was acquired by transfer from the War Department under date of June 15, 1920. The huge amount of work incident to its transfer to the Public Health Service was accomplished in a remarkably short time. By rearrangements and use of buildings formerly devoted to other purposes, the capacity of the hospital was greatly increased. On July 1, 1920, there were 405 patients in the hospital, on June 30, 1921, there were 965.

This station, because of its location, isolation and size, naturally has many facilities not found at other stations of the service, such as a large farm, a cemetery, a community church, a station bank, which is a branch of the Silver City National Bank, a moving-picture theater, etc.

Senior Surg. H. E. Whitley (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 56, BALTIMORE, MD.

This station formerly constituted the Fort McHenry Military Reservation and was acquired by transfer from the War Department to the Public Health Service on January 17, 1920. It was opened as a Public Health Service hospital on July 1, 1920. Present capacity is 1,012 beds.

The reservation covers an area of 45 acres and contains 115 buildings, mostly wooden structure. Most of the buildings are of a temporary nature, being the type that were built during the war. It was necessary to make extensive repairs during the fiscal year 1921, and for this purpose the sum of \$74,000 was expended. In order to comply with an act of Congress to allow space for the proposed Key Memorial it was necessary to salvage an officer's quarters, the general mess and officers' mess, and to build a new mess hall. This has been completed.

An interesting feature of the station is its School of Anesthesia for nurses, which was instituted in March, 1921. Ten nurses have taken the course and have been assigned to various hospitals of the service as anesthetists.

Senior Surg. T. R. Payne (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 57,
KNOXVILLE, IOWA.

United States Public Health Service Hospital No. 57 is a neuro-psychiatric hospital. The land and buildings were leased for a term of five years with an option to purchase from the State board of control. This original lease was under date of May 17, 1920, and called for the buildings and small acreage surrounding same. On January 24, 1921, the Public Health Service leased the farm consisting of about 345 acres. A private home and 10 acres of land adjoining the State lands were also leased from Mr. C. N. Dykstra. The Public Health Service took possession of the property on June 8, 1920, and it was opened as a Public Health Service hospital on August 16, 1920. Present capacity is 172 beds of which 170 are occupied.

The buildings on the station are permanent structures and consist of an administration building, two cottages for personnel, power house, machine shop, two garages, two barns, reconstruction shop. Red Cross hut, storehouse, root cellar, and other small buildings. It is contemplated to increase the capacity of the hospital to 300 beds by altering certain buildings and erecting a number of portable houses.

The farm is well drained and has very fertile land. During the past year it has been very productive. There are several acres in orchards which produced a large quantity of fruit. A total of 40 acres of land on the reservation is used for recreational purposes. On this ground, there is a golf course, an athletic field for baseball and other outdoor sports, a tennis court, etc. The recreation department at this station plays an important part in the treatment of neuro-psychiatric patients.

Senior Surg. C. A. Barlow (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 58,
NEW ORLEANS, LA.

United States Public Health Service Hospital No. 58 is a neuro-psychiatric hospital. The property was leased from the Shell Beach Land & Improvement Co. under date of July 1, 1920, the Government reserving the right to occupy this property until 1925. The hospital building is a wooden structure. A considerable number of alterations and repairs were necessary in order to properly fit the building for service as a Public Health Service hospital. These alterations were begun on October 15. The first patients were admitted on September 16, 1920, and thereafter a limited number of patients were taken until January 19, 1921, when alterations were completed and the hospital was opened to its full capacity of 80 beds.

Acting Asst. Surg. E. McConnelly, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 59,
TACOMA, WASH.

United States Public Health Service Hospital No. 59 was formerly known as the Cushman Indian School and was acquired by transfer from the Interior Department. The land and buildings are owned by the Government. The hospital buildings are wooden structures

and have a capacity of 245 beds, of which 124 are available for tuberculosis patients and 121 for neuro-psychiatric patients. At the present time, 213 beds are occupied.

The medical officer in charge assumed charge of the station on August 12, 1920, and found that a considerable number of alterations and repairs were necessary to fit the station for use as a Public Health Service hospital. The work of repairing and remodeling the buildings, installing equipment, and improving the condition of the grounds was immediately begun, and on September 11, 1920, the hospital was opened for the reception of patients.

The water supply for the station is derived from a spring which is located about 2 miles south of the station. The supply has proved to be abundant and of excellent quality.

Surg. G. B. Story (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 60, OTEEN, N. C.

United States Public Health Service Hospital No. 60 is a tuberculosis hospital. The property was transferred from the Army to the United States Public Health Service on October 15, 1920, and is located in Buncombe County, N. C., $6\frac{1}{2}$ miles from the city of Asheville.

The hospital proper consists of 259.66 acres of land, occupied by 116 miscellaneous buildings. Approximately 80 acres of this reservation is devoted to lawns, roadways, parks, etc. The land on which the hospital stands was acquired by condemnation proceedings instituted by the War Department, under which proceedings it was taken over by the Public Health Service.

The maximum capacity for patients is 1,100. All of the 116 buildings on the reservation are occupied, the hill group, which are not suitable for patients, being utilized as temporary quarters for medical officers. The construction of this hospital is purely temporary, being wood throughout, beaverboard partitions, tar-paper roofs, and no foundations, all buildings being placed on wooden posts. There have been no buildings added to this reservation since its acquisition by the Public Health Service.

Surg. J. E. Miller (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 61, FOX HILLS,
STATEN ISLAND, N. Y.

This station was taken over from the Army under date of October 15, 1920, and immediately began to operate as a Public Health Service hospital. Before the station was opened an allotment of \$55,000 was made for the purpose of repairing and renovating the buildings. Upon the acquisition of the property by the Public Health Service painting and repair work was immediately begun and has gone steadily forward. The painting of the outside of the buildings is progressing favorably at this date. The hospital was opened with 86 patients who were transferred from the Army. The station has been greatly overcrowded, at one time reaching the maximum of 1,200 patients. The present capacity of the hospital is 1,077 beds. Additional beds will soon be made available. The topography of the site, together with the architectural design and

grouping of the buildings and their physical condition has made it imperative that a large and constantly increasing personnel be employed at this station.

The station has an orthopedic department which makes, modifies, and repairs orthopedic appliances.

Senior Surg. J. O. Cobb, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 62, AUGUSTA, GA.

The hospital reservation at Augusta, Ga., consists of 33 buildings on a tract of land covering over 195 acres. Part of the land (20 acres) and the hospital building were acquired by lease from the Lenwood Hotel property owners on January 17, 1920. The other buildings, which formerly constituted the base hospital of Camp Hancock, were taken over from the Army on July 2, 1919. Two tracts of land, one covering 156.93 acres and the other, 18.25 acres, adjacent to the Lenwood Hotel land, are also leased from private owners. The property was opened as a Public Health Service station on November 22, 1920.

There necessarily had to be a large amount of construction and repair work done before the hotel and base hospital buildings were made suitable for the purposes of a Public Health Service station. Total allotments for construction and repairs amounted to \$101,200.

Since the opening of the hospital, great progress has been made. On the opening date in November, 1920, there were 40 beds available. On July 1, 1921, the bed capacity was 200, and there was a total of 207 patients.

Senior Surg. F. E. Leslie (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 63, LAKE CITY, FLA.

This station was formerly occupied by the University of Florida. The property was purchased from the city of Lake City, Fla. The station was officially opened for the reception of patients on December 6, 1920, at which time 78 beds were available.

The reservation covers an area of 300 acres. Fourteen acres immediately east of the present building site has also been rented, as it is necessary to control this land, which very closely approaches the hospital buildings. As much land as possible is being cultivated, but not much is hoped for from the farm this year. Next season, however, the yield should be satisfactory. There are about 15 buildings of various construction on the station. Five of these have now been entirely renovated and the rest will be repaired as soon as practicable, recommendations having already been made by the Supervising Architect's Office regarding these repairs and also certain new construction. When all this repair work and contemplated new construction is completed, this station will accommodate nearly 400 patients and necessary employees. At present there are 130 beds available, 108 of which are occupied.

Surg. A. P. Goff (R.), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 64, CAMP KEARNY, CALIF.

United States Public Health Service Hospital No. 64 formerly constituted the base hospital of Camp Kearny and was transferred

from the War Department to the Public Health Service in November, 1920. The reservation covers an area of 320 acres and is located 17 miles from San Diego, in which city subsistence supplies for the hospital are purchased. The capacity of the hospital is 550 beds. When acquired, repairs were needed and equipment was lacking.

The Public Health Service began the work of rehabilitation at once by acquiring from the quartermaster at Camp Kearny, surplus Army supplies to the amount of \$237,027.69. A very considerable amount of cleaning and repair work was done and by January 1, 1921, the hospital was ready to receive patients.

Surg. F. H. McKeon, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 65, ST. PAUL, MINN.

United States Public Health Service Hospital No. 65, is an eight-story and basement brick structure located on Dayton Avenue at Virginia Street. The property runs through from Dayton Avenue to Selby Avenue and includes a small park in the rear of the building, to which there is no direct entrance from the building, except from the basement. The hospital was built about 30 years ago as an apartment hotel (Aberdeen Hotel) and was used as such up to the time of its lease to the United States Government. The matériel officer arrived December 2, 1920, under orders from the bureau to take over the building from its owners. The work of cleaning and renovating the hotel for use as a Public Health Service hospital was immediately begun and the hotel was taken over officially on January 1, 1921. It was opened for the reception of patients on January 24, 1921.

The hospital building is in good repair but much of the equipment is old and defective. It was opened with four wards ready for the admission of patients, with 150 beds available. Since the opening date the capacity of the hospital has been gradually increased so that on July 1, 1921, 290 beds were available. The ultimate capacity can be made 350 beds if nurses and other employees are quartered outside.

Surg. C. H. Gardner, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO 66, CARVILLE, LA.

This property was formerly known as the Louisiana Leper Home and was transferred to the Public Health Service from the State of Louisiana on January 3, 1921. The station is essentially a "home" and not a hospital, there being no facilities available for the proper hospitalization of patients. It is planned to convert this institution into a National Leper Home capable of accommodating 500 lepers. Its present capacity is 120 beds, 116 of which are occupied.

Considering the character of this institution, its location, etc., it is evident that great difficulties must be encountered in operating it. The personnel situation is particularly bad, the Civil Service Commission finding it next to impossible to supply the station with proper help. At its acquisition, the buildings, grounds, and mechanical equipment were in a very poor state of upkeep. Since its occupancy by the Public Health Service a very considerable amount of sanitation work has been done, redigging ditches, clearing underbrush, etc.,

and placing the reclaimed territory under cultivation. About half the plantation has been cleared, and the work is progressing rapidly. Sanitary conditions have been greatly improved as the result of drainage, and the mosquito nuisance has been considerably diminished. Eighty-eight acres have been put under cultivation. The lack of quarters for personnel was met by the erection of nine portable houses. Construction is now under way which will increase the bed capacity by about 75 beds.

Surg. O. E. Denny (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 67, KANSAS CITY,
MO.

This station was formerly occupied as a private hospital (Wesley Hospital), and was taken over by the United States Government for the use of the Public Health Service on December 20, 1920, under lease until December 31, 1925. The hospital was opened for patients as a general hospital, January 25, 1921. Present capacity is 125 beds.

The hospital building is a modern five-story brick building of fireproof construction, with a three-story brick building adjoining, which is used as a nurses' home. The first floor of the hospital building proper is used for administrative offices, kitchens, dining rooms, and drug rooms. The X-ray department is located on the second floor. The dental department, now in process of installation, is also located on this floor. A well-equipped surgical department and a bacteriological laboratory are located on the fifth floor. The second, third, fourth, and fifth floors, except as above noted, are divided into rooms for patients. Each room contains two beds, except for four rooms containing three beds each, and one six-bed ward. There is a small solarium located on each floor, where are found books, newspapers, games, etc., which have been donated for the use of the hospital patients.

The buildings and grounds of the station are in good repair and have not required any repairs of a major scope.

Surg. George Parcher, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 68, MINNEAPOLIS,
MINN.

United States Public Health Service Hospital No. 68 was formerly known as the Asbury Hospital, and was acquired by lease for a period of five years from the Methodist Episcopal Church, which owned and administered it. Prior to the opening of the hospital by the Public Health Service, the property in the hospital was purchased for the sum of \$76,249.77. The hospital is a modern, well-built, fireproof building, five stories high, and occupies a half block in the center of the city. It was opened as a Public Health Service hospital on February 8, 1921. The present capacity is 310 beds.

Prior to the opening of this hospital, Service patients were taken care of in contract hospitals, viz, St. Mary's Hospital, St. Barnabas Hospital, Thomas Hospital, and Asbury Hospital. When it became known that the latter was to be leased to the Government,

medical and surgical cases were sent in during January as rapidly as possible, so that at the time of taking the hospital over there were 165 cases already in the hospital. An overflow of patients made it necessary to continue some of the contract hospitals for a time. The last cases in St. Mary's Hospital were transferred to this hospital on March 18, 1921. The treatment of tuberculosis cases at Thomas Hospital has been continued up to the present time.

Surg. H. M. Bracken (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 69, NEWPORT, KY.

This station is leased property, formerly known as the Altamont Hotel, and was opened in February, 1921. It has a capacity of 100 beds, and when remodeling work is completed it will increase the capacity to 150 beds.

Surg. W. A. Korn, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 70, NEW YORK CITY, N. Y.

United States Public Health Service Hospital No. 70 was formerly known as the House of Relief and was operated and owned by the Society of New York Hospital Association. This property was purchased by the Government on October 23, 1919. Extensive alterations and remodeling was necessary to meet the needs of the Public Health Service. The hospital was formally opened December 9, 1920. The property consists of two buildings of red-brick construction, located on the corner of Hudson and Jay Streets. The hospital is easily reached from all parts of the city. The main building has five stories and a basement which is used for the storing of unserviceable property. The station rents a three-story brick residence for a nurses' home. It is operated chiefly as an out-patient office and large city clinic for emergency treatment, with a capacity of approximately 40 beds.

Surg. H. J. Warner, medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 71, STERLING JUNCTION, MASS.

United States Public Health Service Hospital No. 71 is leased from the Worcester Red Cross and is used as a convalescent hospital. Minor repairs and alterations have been made from time to time, and it will be necessary to undertake considerable work in connection with the heating system before cold weather. Bed capacity, 53.

Surg. Karl Reeves (R), medical officer in charge.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL NO. 72, HELENA, MONT.

This station, located at Helena, Mont, is a military reservation under control of the War Department and was loaned to the Public Health Service under date of November 20, 1919, for hospital purposes. It was opened to receive patients, June 6, 1921. The deficiency bill approved March 6, 1920, appropriated \$100,000 for the remodel-

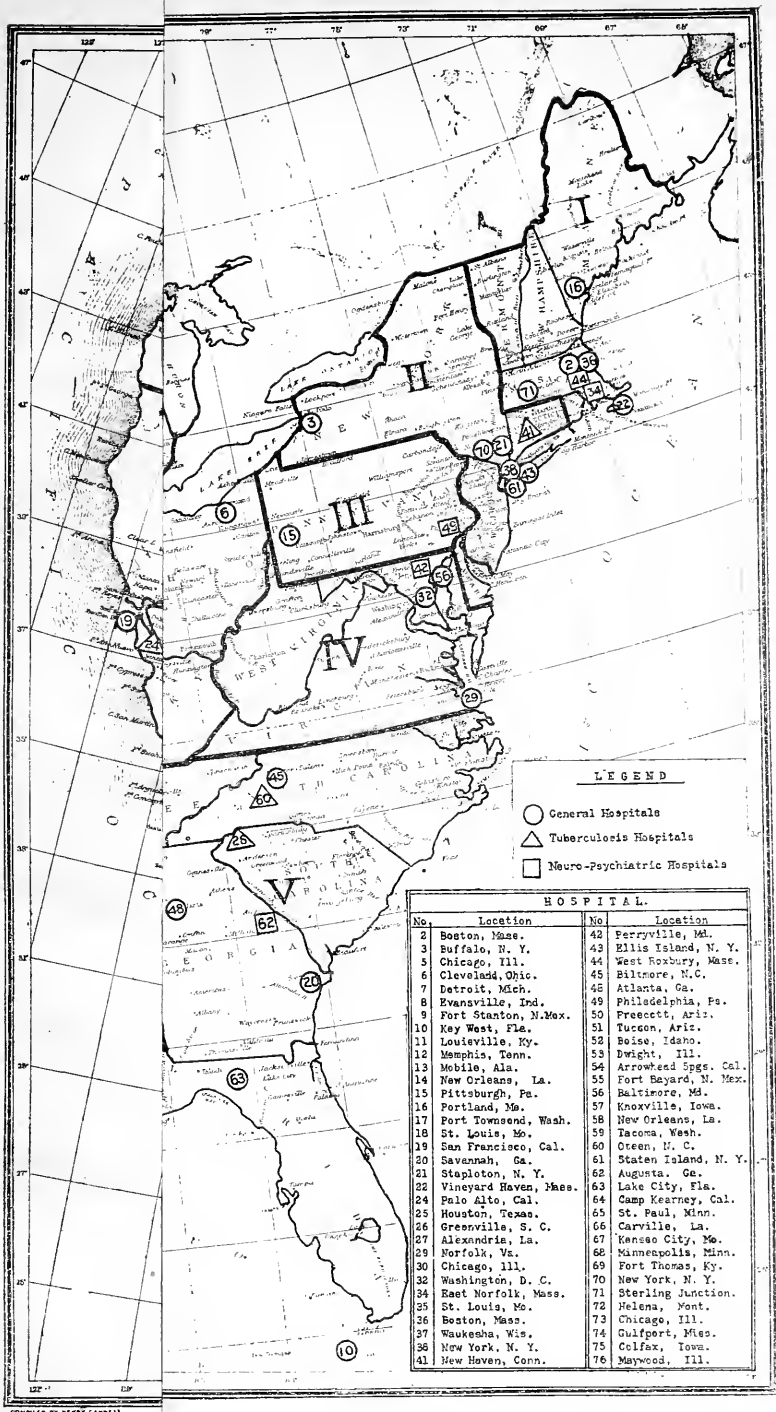
ing and altering of the buildings, and this work is nearly completed. Much has been done in the way of cleaning up the grounds and sowing them in grass.

Surg. T. D. Tuttle (R), medical officer in charge.

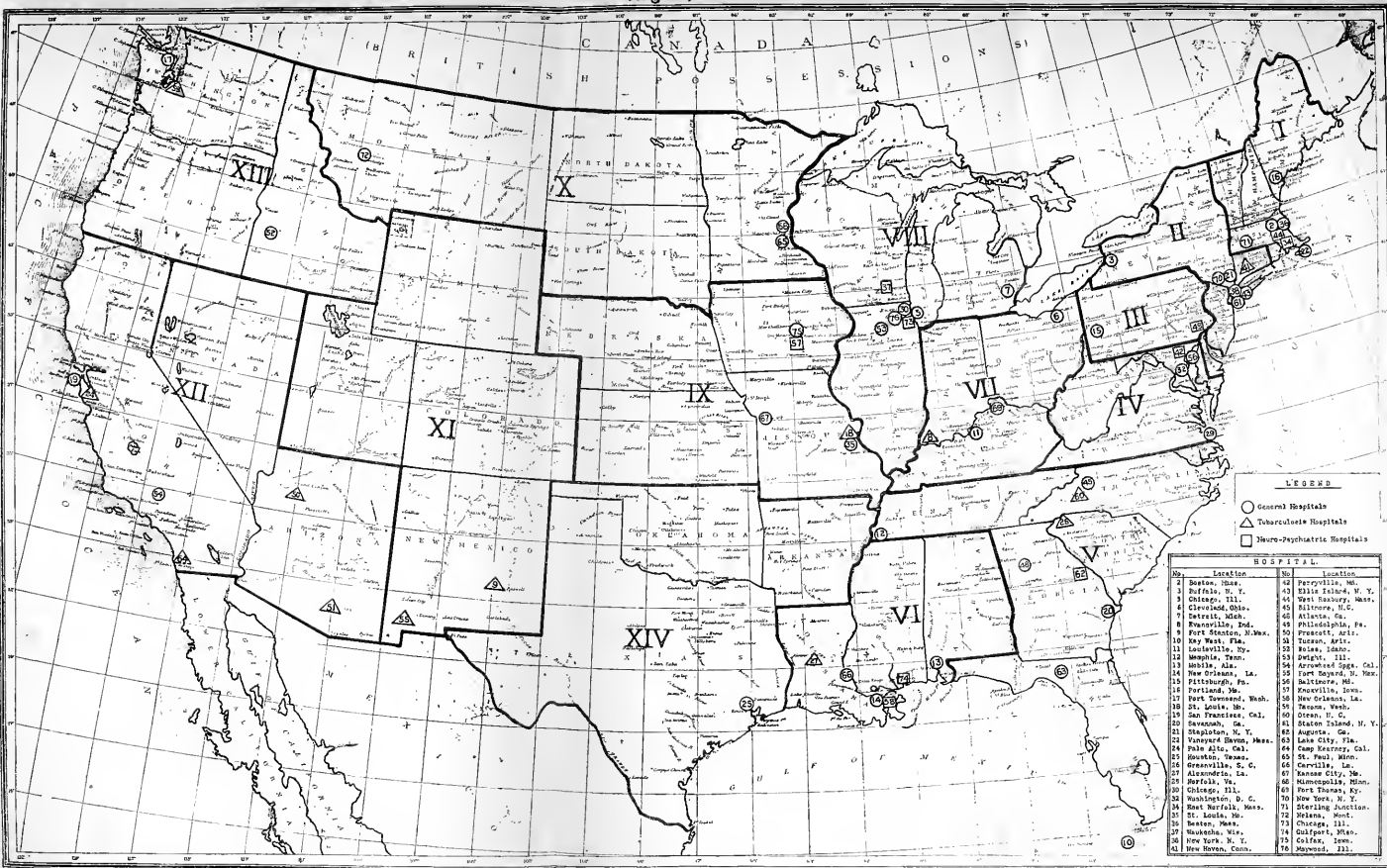
NEW HOSPITALS.

The stations indicated in the following table will be opened within the near future:

Location.	Property.	District.	Bed capacity.	Designation.
Colfax, Iowa.....	Colfax Hotel.....	IX	200	General.
Excelsior Springs, Mo.....	Excelsior Springs Hotel.....	IX	200	Tuberculosis.
Dawson Springs, Ky.....	Dawson Springs.....	VII	500	Do.
Portland, Oreg.....	Hahnemans Hospital.....	XIII	170	General.
Chicago, Ill.....	Speedway.....	VIII	850	Do.
Walla Walla, Wash.....	Fort Walla Walla.....	XIII	240	Tuberculosis.
Sheridan, Wyo.....	Fort Mackenzie.....	X	400	Do.
North Little Rock, Ark.....	Fort Logan H. Roots.....	XIV	240	Neuro-psychiatric.
Gulfport, Miss.....	Naval training station.....	VI	200	Do.
Mobile, Ala.....	Southern Infirmary.....	VI	75	General.
Chicago, Ill.....	Jackson Park Hospital.....	VIII	100	Neuro-psychiatric.

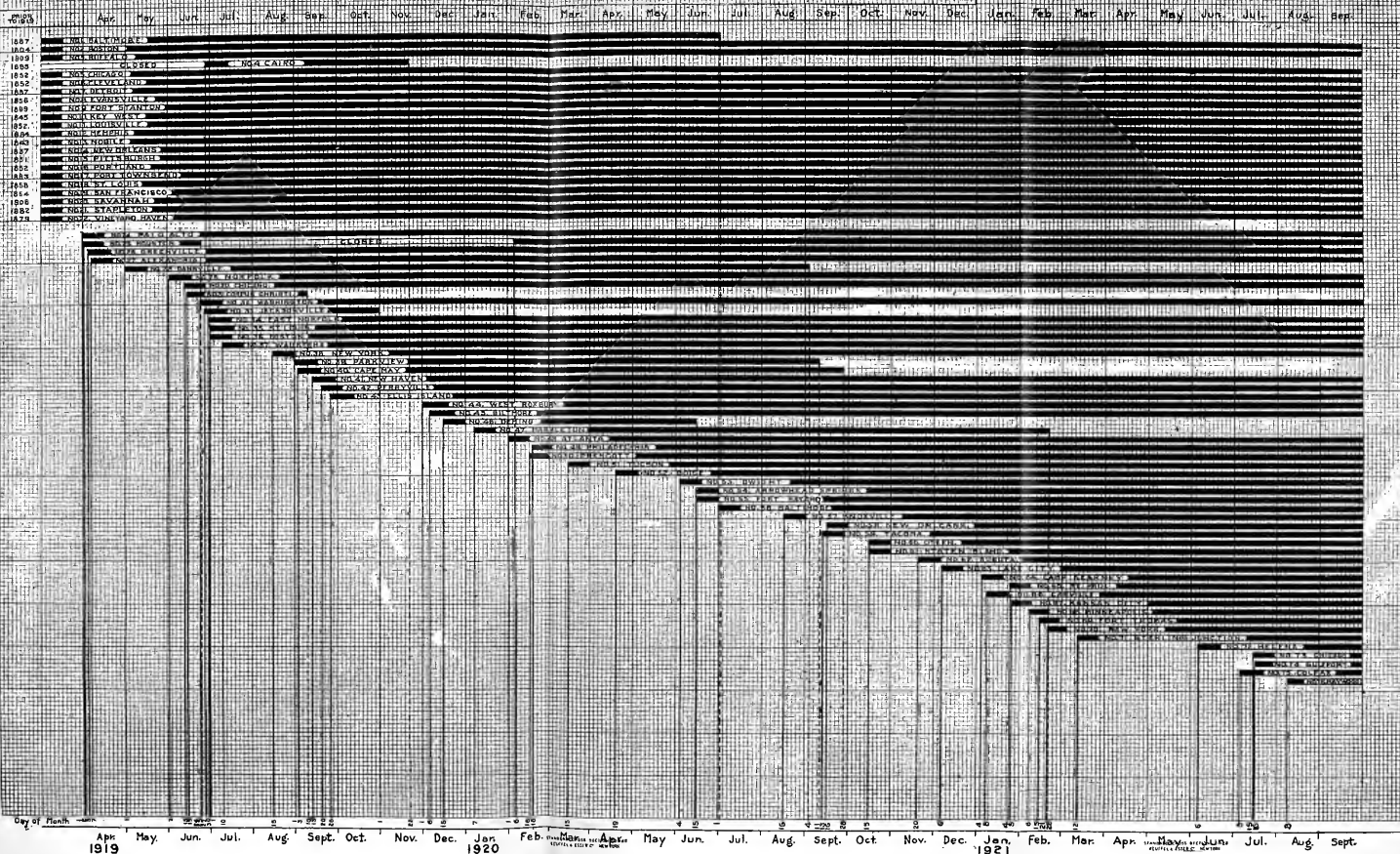


LOCATION OF HOSPITALS, U.S.P.H.S. August, 1921



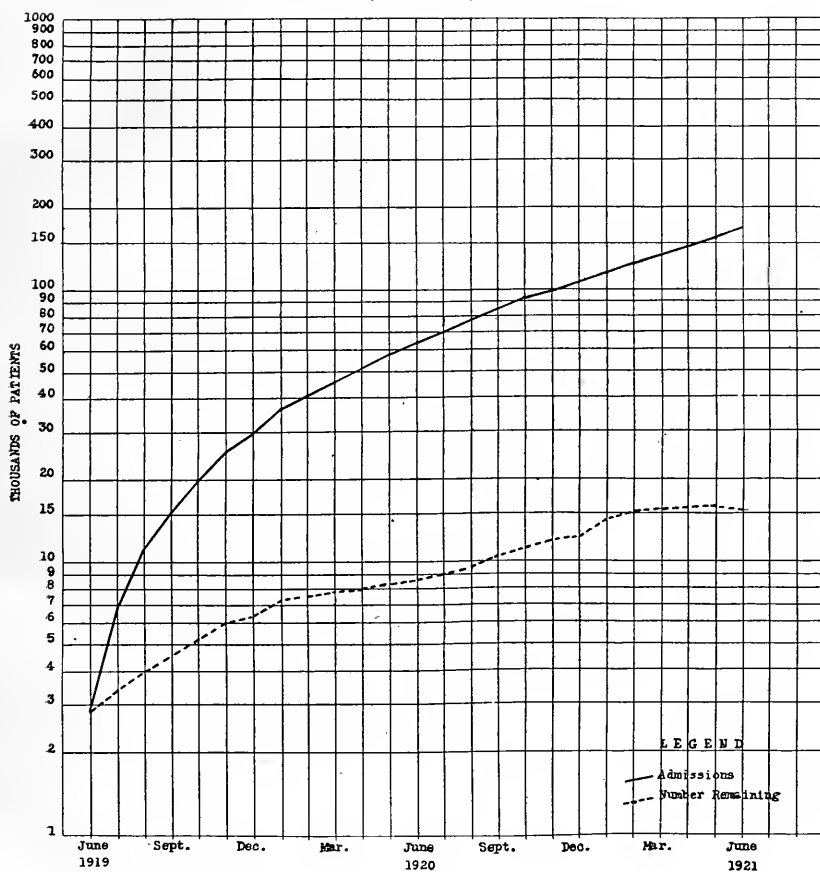
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OPENING AND CLOSING DATES OF U.S.P.H.S. HOSPITALS.



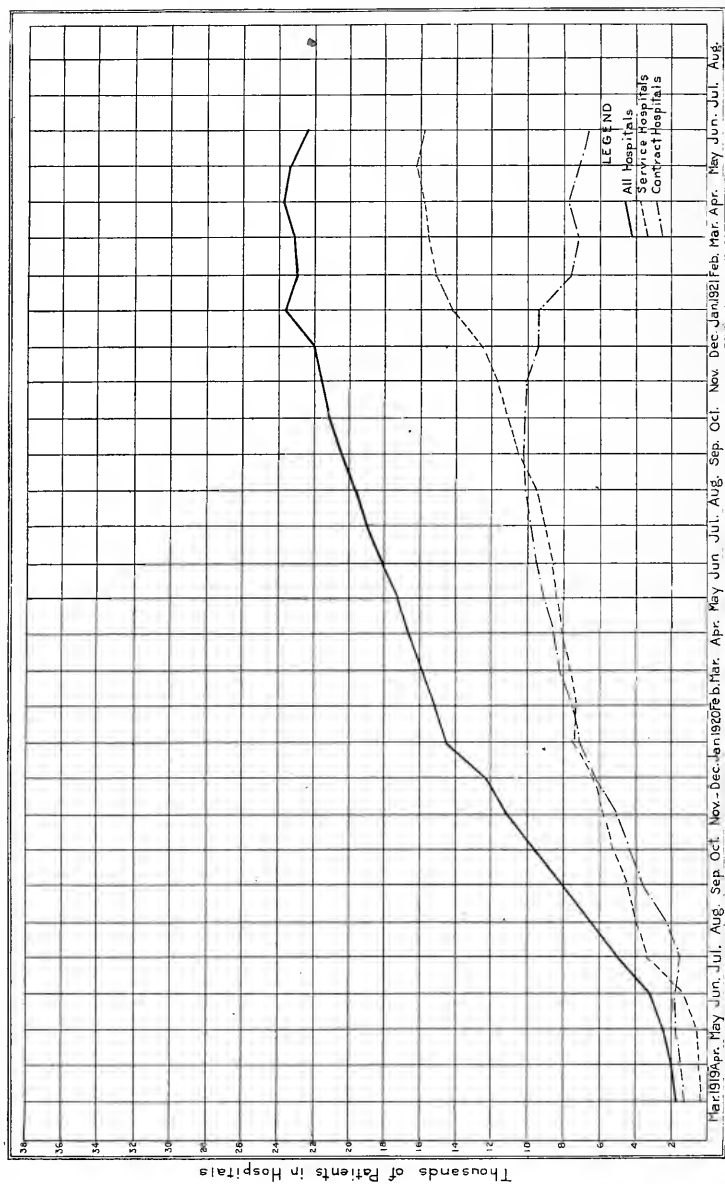
CHARTS SHOWING ACTIVITIES OF THE HOSPITAL DIVISION.

CUMULATIVE ADMISSIONS AND NUMBER OF PATIENTS REMAINING,
U.S. MARINE AND U.S.P.H.S. HOSPITALS.
JUNE, 1919 - JULY, 1921.



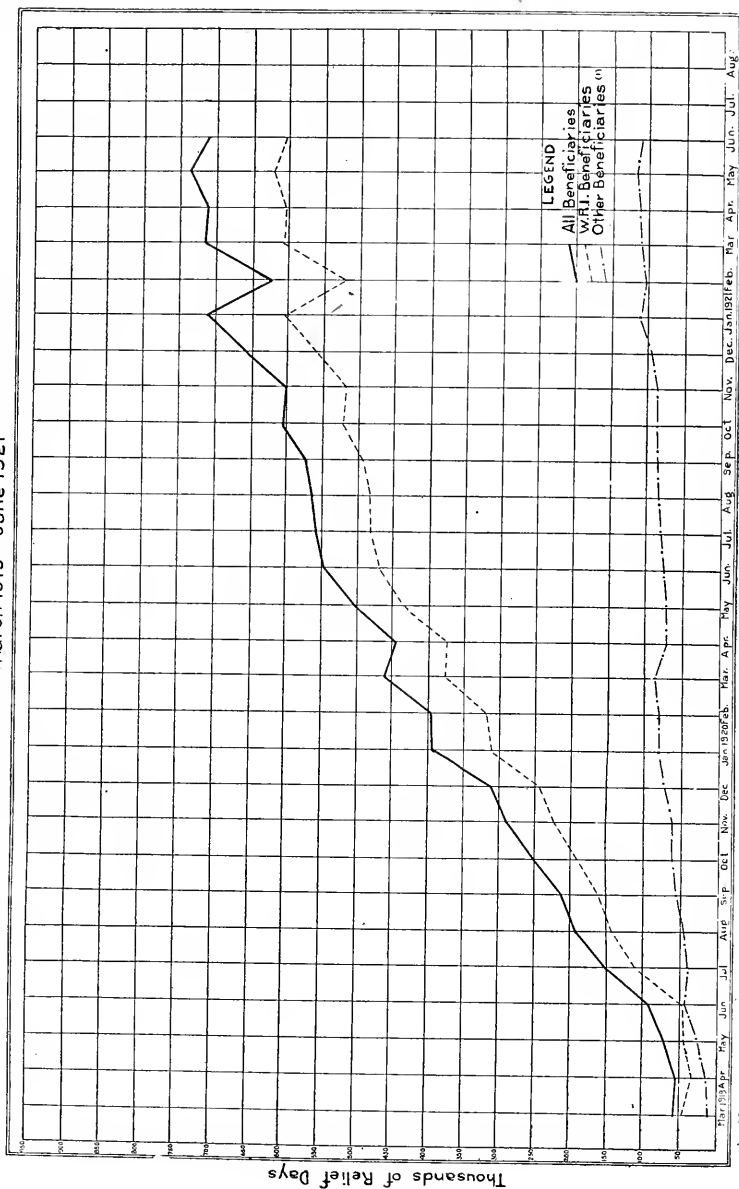
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NUMBER OF PATIENTS IN HOSPITAL AT END OF EACH WEEK,
SERVICE AND CONTRACT HOSPITALS, U. S. P. H. S.,
MARCH, 1919—JUNE, 1921.



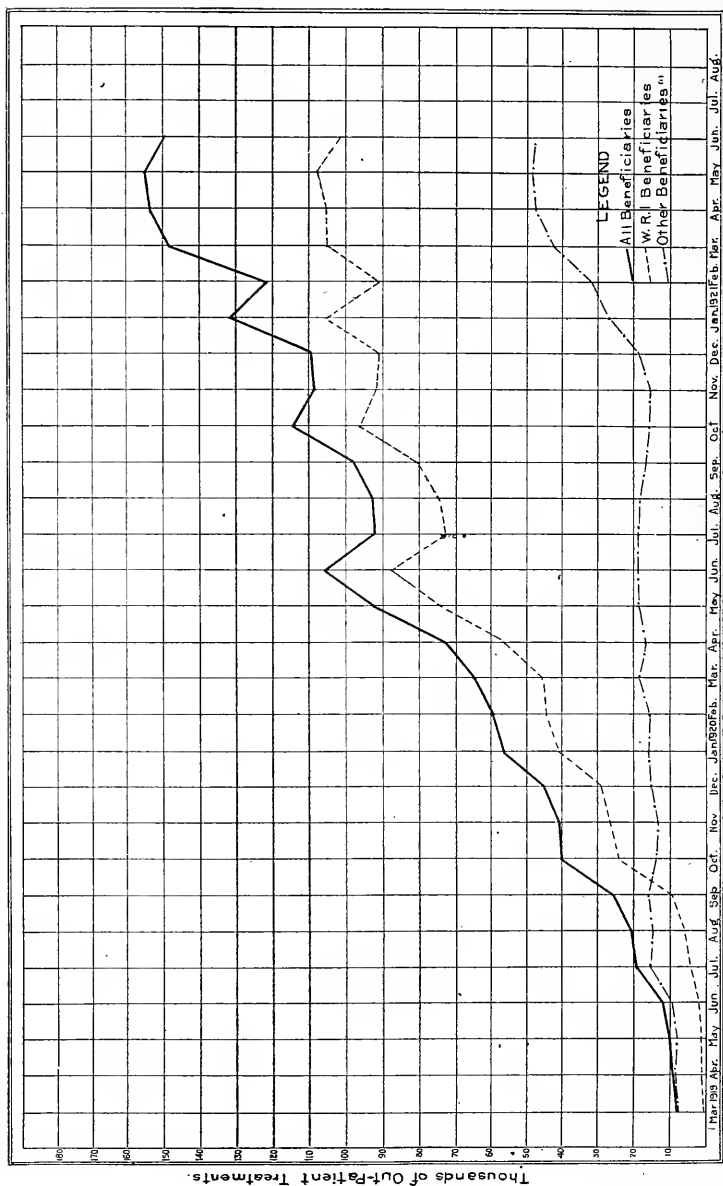
NUMBER OF HOSPITAL DAYS' RELIEF FURNISHED BY MONTHS ALL STATIONS OF THE U.S. PUBLIC HEALTH SERVICE

March 1919 — June 1921



1) Others include beneficiaries of the Federal Board for Vocational Education.

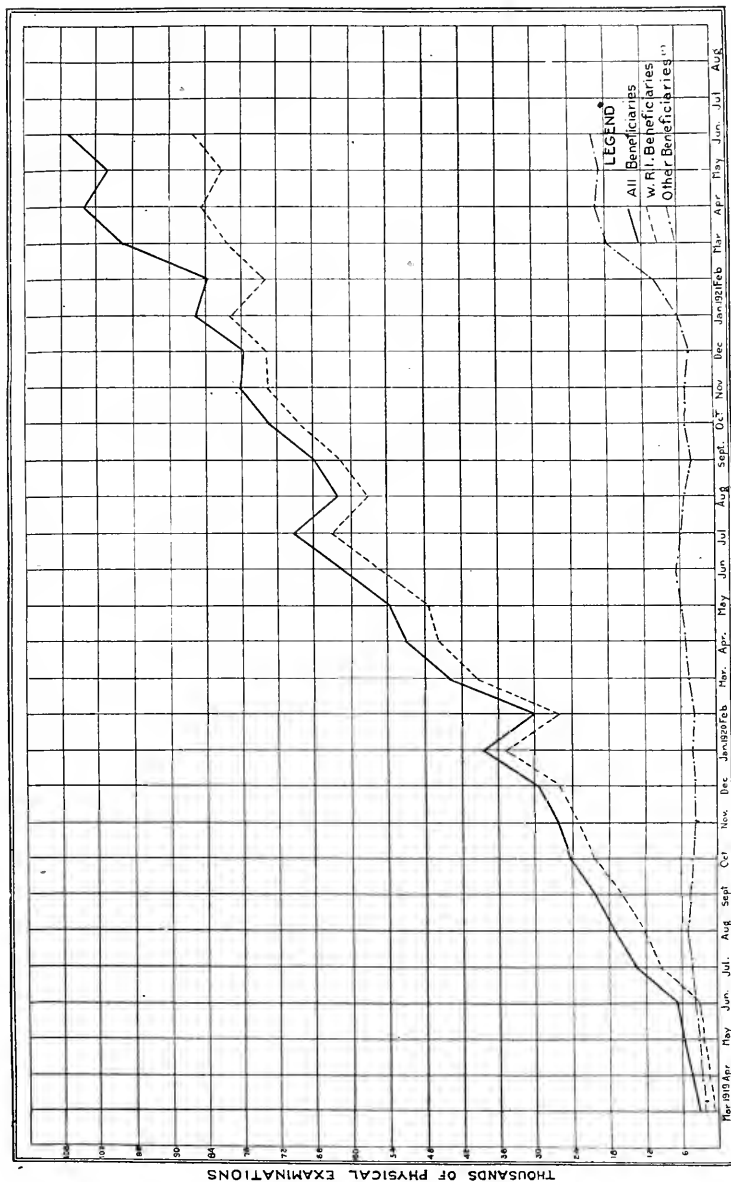
NUMBER OF OUT-PATIENT TREATMENTS FURNISHED BY MONTHS
ALL STATIONS OF THE U.S. PUBLIC HEALTH SERVICE
March, 1919-June 1921 incl.



1) "Others" include beneficiaries of the Federal Board for Vocational Education.

NUMBER OF PHYSICAL EXAMINATIONS FURNISHED BY MONTHS ALL STATIONS OF THE U.S. PUBLIC HEALTH SERVICE

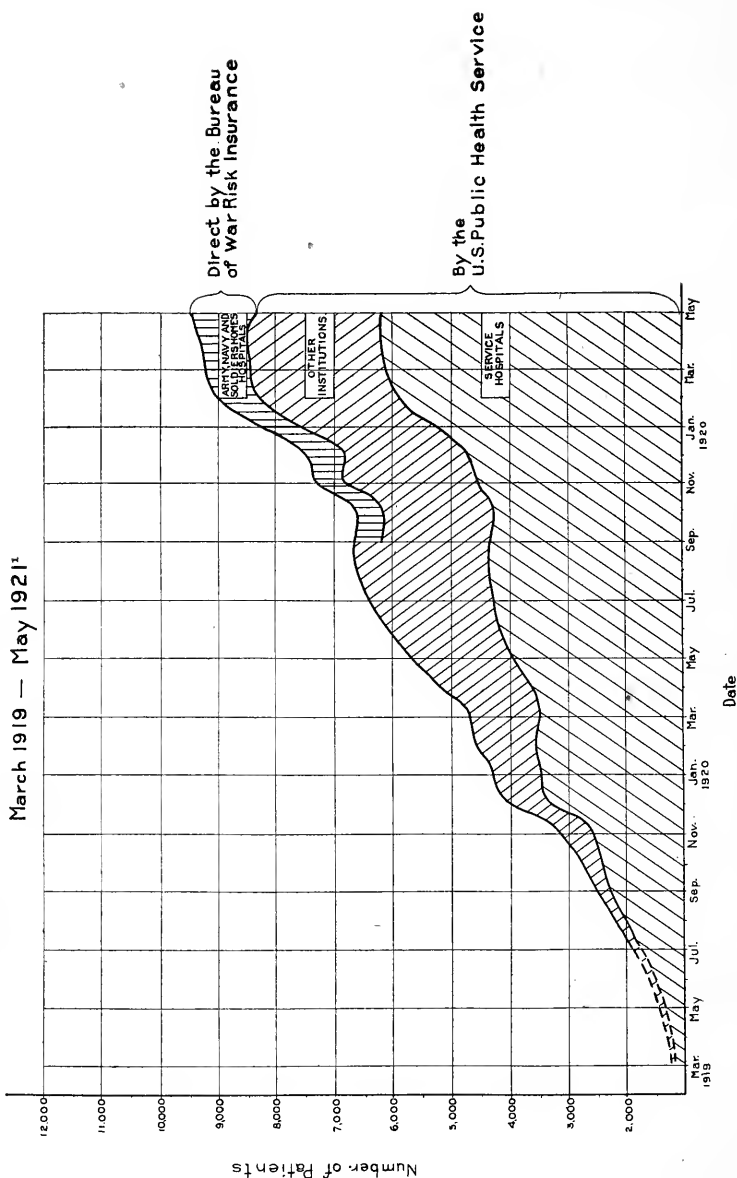
March 1919—June 1921



1) Others include beneficiaries for the Federal Board for Vocational Education.

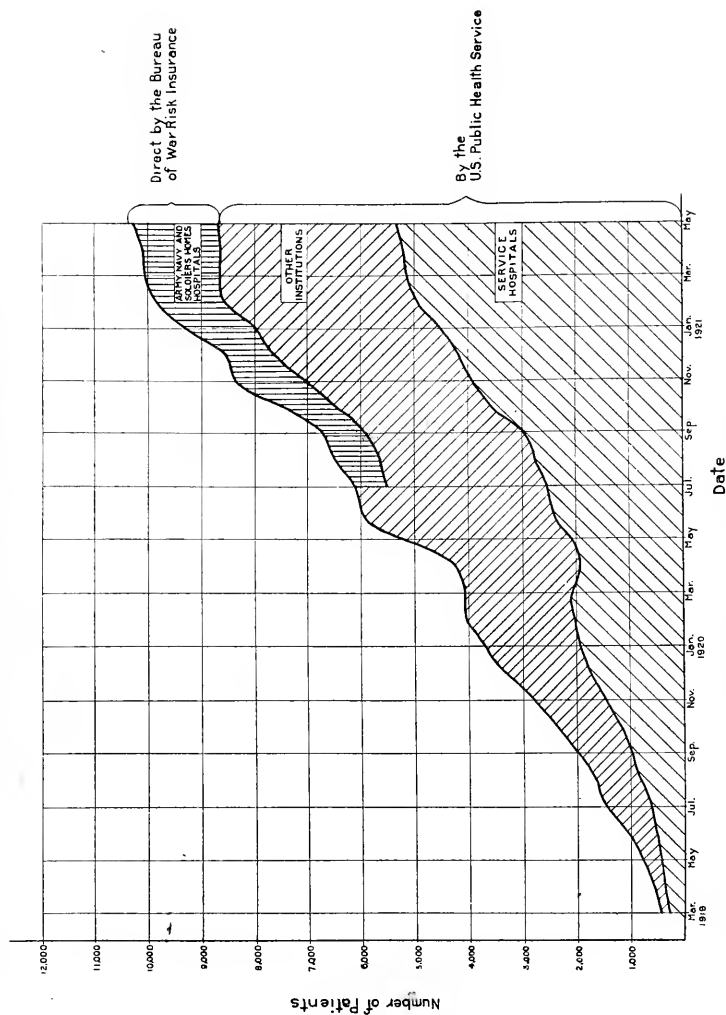
HOSPITALIZATION OF WAR RISK INSURANCE PATIENTS.

I. GENERAL MEDICAL AND SURGICAL CASES



¹Pursuant to an order of the Secretary of the Treasury dated April 19, 1921, the activities connected with the hospitalization of War Risk Insurance patients in most of the contract institutions were transferred to the Bureau of War Risk Insurance. This transfer was in process during the months of May and June, 1921.

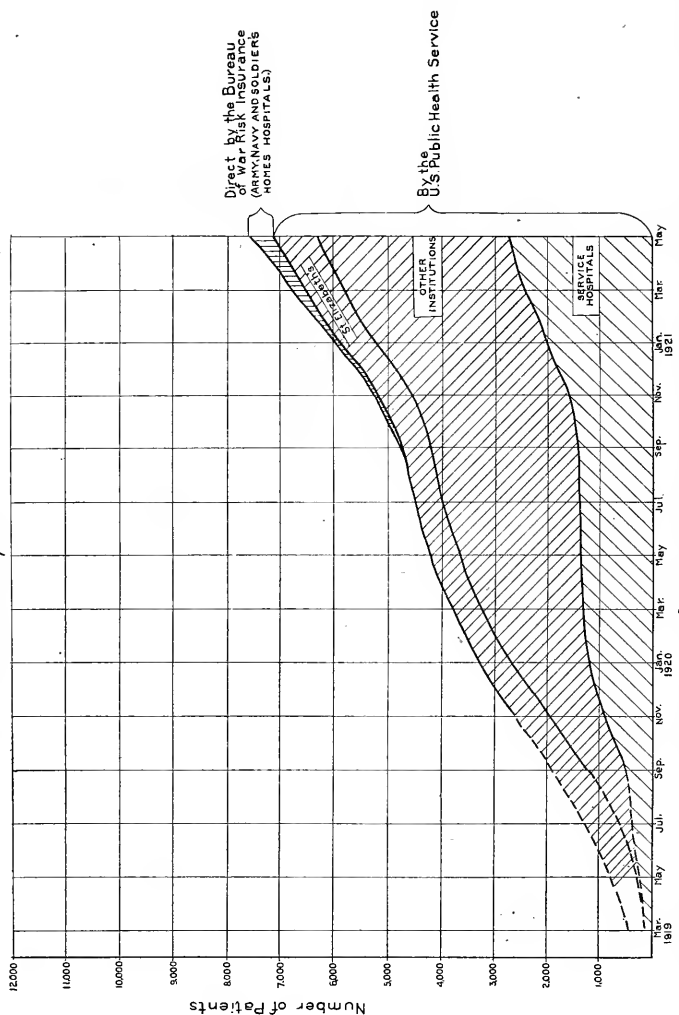
HOSPITALIZATION OF WAR RISK INSURANCE PATIENTS.

II. TUBERCULOSIS CASES, MARCH, 1919—MAY, 1921.¹

¹ Pursuant to an order of the Secretary of the Treasury dated April 19, 1921, the activities connected with the hospitalization of War Risk Insurance patients in most of the contract institutions were transferred to the Bureau of War Risk Insurance. This transfer was in process during the months of May and June, 1921.

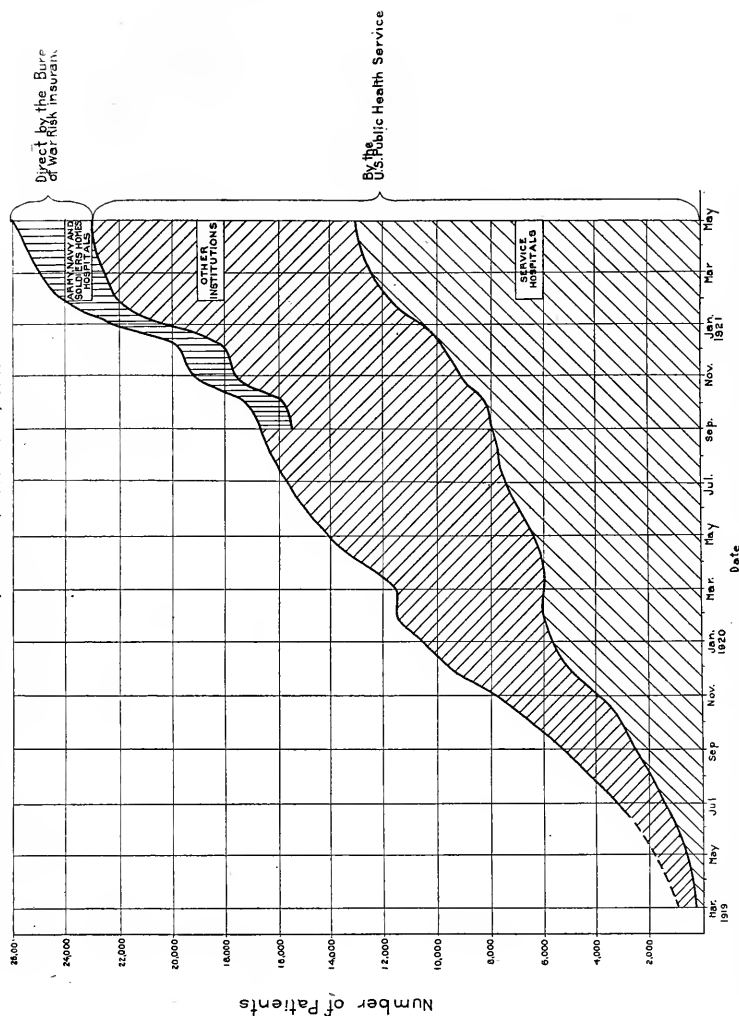
HOSPITALIZATION OF WAR RISK INSURANCE.

III. NEURO PSYCHIATRIC CASES

March 1919 — May 1921.¹

¹ Pursuant to an order of the Secretary of the Treasury dated April 19, 1921, the activities connected with the hospitalization of War Risk Insurance patients in most of the contract institutions were transferred to the Bureau of War Risk Insurance. This transfer was in process during the months of May and June, 1921.

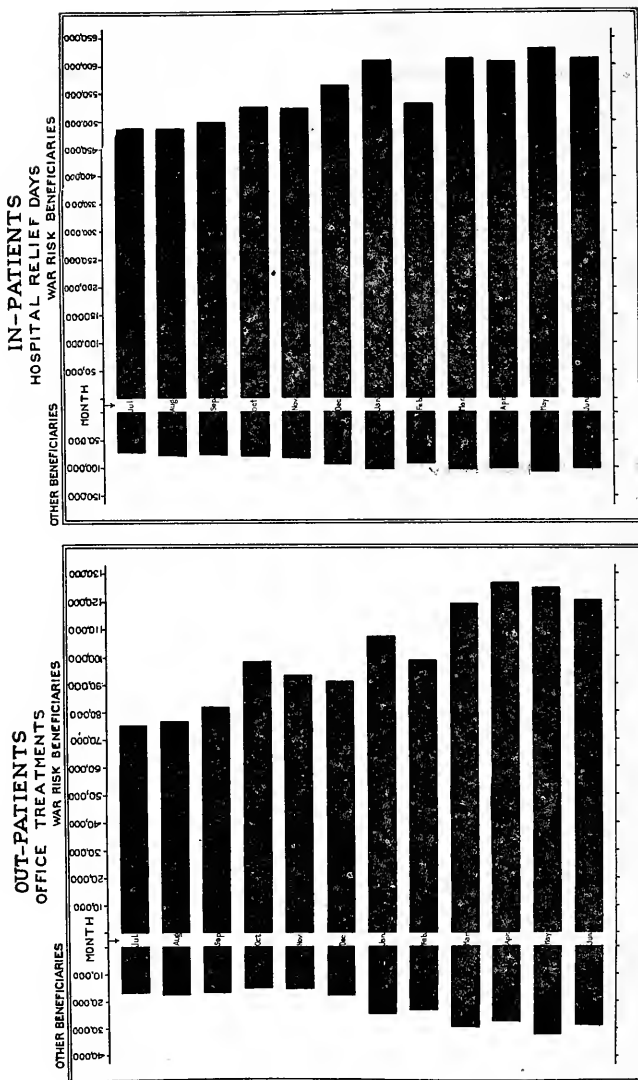
HOSPITALIZATION OF WAR RISK INSURANCE PATIENTS.

IV. ALL TYPES OF CASES, MARCH, 1919—MAY, 1921¹

¹ Pursuant to an order of the Secretary of the Treasury dated April 19, 1921, the activities connected with the hospitalization of War Risk Insurance patients in most of the contract institutions were transferred to the Bureau of War Risk Insurance. This transfer was in process during the months of May and June, 1921.

TOTAL RELIEF BY MONTHS U.S. PUBLIC HEALTH SERVICE

FISCAL YEAR 1921



NOTE.—Relief furnished by district supervisors was included for the entire year. Pursuant to an order of the Secretary of the Treasury, dated April 19, 1921, the activities of District supervisors were transferred to the Bureau of War Risk Insurance; this transfer was in process during the months of May and June, 1921.

STATISTICAL TABLES.

TABLE I.—*Number of patients treated annually, 1868 to 1921.*

Fiscal year.	Sick and disabled patients furnished relief.	Fiscal year.	Sick and disabled patients furnished relief.
Prior to reorganization:		After reorganization—Continued.	
1868.....	11, 535	1895.....	52, 643
1869.....	11, 356	1896.....	53, 804
1870.....	10, 560	1897.....	54, 477
After reorganization:		1898.....	52, 709
1871.....	14, 256	1899.....	55, 489
1872.....	13, 156	1900.....	56, 355
1873.....	13, 529	1901.....	58, 381
1874.....	14, 356	1902.....	56, 310
1875.....	15, 009	1903.....	58, 573
1876.....	16, 808	1904.....	58, 556
1877.....	15, 175	1905.....	57, 013
1878.....	18, 223	1906.....	54, 363
1879.....	20, 922	1907.....	55, 129
1880.....	24, 860	1908.....	54, 301
1881.....	32, 613	1909.....	53, 704
1882.....	36, 184	1910.....	51, 443
1883.....	40, 195	1911.....	52, 209
1884.....	44, 761	1912.....	51, 078
1885.....	41, 714	1913.....	50, 604
1886.....	43, 822	1914.....	53, 226
1887.....	45, 314	1915.....	55, 782
1888.....	48, 203	1916 ¹	68, 398
1889.....	49, 518	1917.....	64, 022
1890.....	50, 671	1918.....	71, 806
1891.....	52, 992	1919.....	93, 719
1892.....	53, 610	1920.....	389, 942
1893.....	53, 317	1921.....	812, 176
1894.....	52, 803		

¹ Includes patients treated at trachoma hospitals.

TABLE II.—Transactions at Marine and Public Health Service Hospitals, District Headquarters, and Relief Stations, fiscal year, 1921.

Location.	Total number of patients treated.	Total number treated in hospital.	Died.	Remaining in hospital June 30, 1921.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number of physical examinations.
Grand total.....	812, 176	183, 016	2, 979	22, 591	7, 771, 671	629, 160	1, 473, 062	1, 004, 551
FIRST-CLASS STATIONS.								
MARINE HOSPITALS.								
2. Boston, Mass.....	5, 849	917	11	87	26, 416	4, 932	8, 451	1, 592
3. Buffalo, N. Y.....	5, 105	647	8	52	20, 089	4, 458	8, 978	5, 225
5. Chicago, Ill.....	1, 839	1, 421	14	117	46, 852	4, 418	2, 106	5, 525
6. Cleveland, Ohio.....	4, 772	1, 009	16	43	22, 877	3, 763	9, 136	5, 348
7. Detroit, Mich.....	3, 539	1, 833	33	261	59, 054	1, 706	2, 912	4, 488
8. Evansville, Ind.....	3, 729	1, 466	9	42	15, 232	2, 638	538	2, 187
9. Fort Stanton, N. Mex.....	368	367	22	184	61, 878	1	1	154
10. Key West, Fla.....	943	518	8	35	11, 322	425	509	136
11. Louisville, Ky.....	3, 027	1, 577	9	38	21, 809	1, 444	6, 778	3, 669
12. Memphis, Tenn.....	1, 877	1, 143	13	67	22, 521	1, 734	1, 122	1, 677
13. Mobile, Ala.....	2, 365	1, 220	4	101	26, 683	1, 145	5, 137	1, 779
14. New Orleans, La.....	10, 909	3, 735	49	313	105, 570	7, 114	15, 350	9, 621
15. Pittsburgh, Pa.....	18, 880	1, 449	21	144	36, 053	17, 441	33, 774	12, 330
16. Portland, Me.....	1, 208	1, 597	7	32	13, 085	611	728	1, 143
17. Fort Townsend, Wash.....	1, 153	1, 094	10	139	42, 168	59	97	12
18. St. Louis, Mo.....	947	947	31	65	22, 916	6, 505	14, 143	2, 854
19. San Francisco, Calif.....	10, 328	3, 823	59	231	84, 975	6, 827	14, 651	3, 595
20. Savannah, Ga.....	8, 046	1, 219	20	98	32, 429	6, 827	20, 866	8, 804
21. Stapleton, N. Y.....	10, 943	2, 508	70	243	94, 487	8, 435	150	9
22. Vineyard Haven, Mass.....	254	138	1	14	4, 584	116		
Total.....	93, 085	26, 688	415	2, 306	771, 000	66, 397	145, 447	60, 148
U. S. PUBLIC HEALTH SERVICE HOSPITALS.								
24. Palo Alto, Calif.....	1, 875	1, 798	64	429	163, 872	77	329	33
25. Houston, Tex.....	5, 612	5, 612	74	682	283, 086			
26. Greenville, S. C.....	2, 522	2, 518	96	579	230, 311	4	21	1, 073
27. Alexandria, La.....	2, 731	2, 731	82	563	162, 864			774
28. Danville, N. Y.....	229	229	1		12, 393			7
29. Norfolk, Va.....	3, 084	2, 709	58	248	93, 853	375	845	333
30. Chicago, Ill.....	20, 829	7, 076	51	411	204, 818	13, 753	53, 113	3, 194
32. Washington, D. C.....	13, 266	2, 449	22	224	79, 841	10, 817	33, 558	21, 101
34. East Norfolk, Mass.....	648	648		143	39, 163			138
35. St. Louis, Mo.....	26, 521	7, 104	44	612	215, 452	19, 417	24, 437	7, 562

36. Boston, Mass.	8,630	3,821	64	423	172,376	4,809	14,561	493
37. Waukesha, Wis.	710	628	3	208	62,837	82	182	111
38. New York, N. Y.	13,899	3,065	39	255	88,420	10,834	37,753	784
39. Hoboken, Pa.	345	321	1		9,300	24	30	
40. Cape May, N. J.	188	188			6,876			
41. New Haven, Conn.	6,404	1,588	88	449	155,344	4,816	11,092	4,811
42. Perryville, Md.	1,467	1,082	2	389	85,973	748		578
43. Ellis Island, N. Y.	16,813	16,704	332	574	204,884	100	293	
44. West Roxbury, Mass.	640	618	4	231	72,714	92	75	
45. Baltimore, N. C.	2,507	2,448	24	323	105,146	50	411	1,012
47. Markleton, Pa.	270	260	4		15,340	1	14	1
48. Atlanta, Ga.	1,799	1,789	8	58	22,467	30	71	5
49. Philadelphia, Pa.	982	1,777	22	427	106,191	205	358	3,505
50. Prescott, Ariz.	1,004	1,002	73	689	193,067	2	4	1,369
51. Tucson, Ariz.	1,363	652	29	122	44,720	741	1,083	492
52. Boise, Idaho.	397	395	7	125	28,029	2	16	375
53. Dwight, Ill.	391	383	5	117	38,076	8	89	3
54. Arrowhead Springs, Calif.	356	343	10	111	39,950	13	31	10
55. Fort Bayard, N. Mex.	2,650	2,546	92	965	305,229	104	227	5,770
56. Baltimore, Md.	8,415	4,314	82	748	196,136	4,101	8,933	2,664
57. Knoxville, Iowa.	237	237	2	170	42,831			
58. New Orleans, La.	437	396	2	59	14,510	41	154	601
59. Tacoma, Wash.	550	507	27	213	41,615	43	387	222
60. Otcoen, N. C.	2,057	1,772	80	738	128,002	285	708	222
31. Staten Island, N. Y.	2,641	2,641	76	884	198,963			
32. Augusta, Ga.	365	310	1	203	98,365	55	79	1
63. Lako City, Fla.	421	421	4	107	17,987			8
61. Camp Kearney, Calif.	519	519	11	212	28,912			
65. St. Paul, Minn.	707	707	4	195	18,936	36	98	37
66. Carville, La.	136	126	7	116	18,837			
67. Kansas City, Mo.	1,980	736	12	112	12,363	1,244	1,724	1
68. Minneapolis, Minn.	2,202	1,254	13	269	39,805	948	2,254	692
69. Newport, Ky.	208	187	2	93	10,063	21	110	6
70. New York, N. Y.	15,976	405	2	17	2,818	15,571	15,729	1,912
71. Sterling Junction, Mass.	77	77		32	7,230			
72. Helena, Mont.	32	32		27	349			3
Total	175,842	86,808	1,624	13,582	4,150,314	89,034	207,447	60,833
Total (all first-class stations)	208,927	113,496	2,039	15,888	4,921,314	155,431	352,894	120,981
DISTRICT HEADQUARTERS. ¹								
1. Boston, Mass.	3,751	3,694	40	820	274,866	60	104,605	63,069
2. New York, N. Y.	30,519	4,216	87	482	378,012	26,273	63,581	87,882
3. Philadelphia, Pa.	57,905	2,768	46	319	165,841	55,137	106,192	59,280
4. Washington, D. C.	19,650	2,218	15	283	129,986	17,432	41,536	41,536
5. Atlanta, Ga.	33,919	3,711	17	245	141,790	30,208	43,325	58,080
6. New Orleans, La.	16,694	2,574	21	157	54,372	14,120	17,436	49,322

¹ This table includes relief furnished by district supervisors during the entire year. Pursuant to an order of the Secretary of the Treasury dated Apr. 19, 1921, the activities of district supervisors were transferred to the Bureau of War Risk Insurance. This transfer was in process during the months of May and June, 1921.

TABLE II.—Transactions at Marine and Public Health Service Hospitals, District Headquarters, and Relief Stations, fiscal year 1921—Continued.

DISTRICT HEADQUARTERS—Continued.									
Location.	Total number of patients treated.	Total number treated in hospital.	Died.	Remaining in hospital June 30, 1921.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number of physical examinations.	
7. Cincinnati, Ohio.....	83,510	7,884	55	750	283,836	88,630	225,196	109,802	
8. Chicago, Ill.....	52,548	8,744	126	778	229,833	43,804	60,093	78,331	
9. St. Louis, Mo.....	19,381	4,900	56	296	176,475	14,481	32,044	50,176	
10. Minneapolis, Minn.....	18,229	4,470	82	333	200,134	13,759	86,738	45,386	
11. Denver, Colo.....	67,191	4,157	51	439	150,059	63,034	99,087	64,655	
12. San Francisco, Calif.....	15,920	1,772	35	484	177,918	14,148	35,755	19,639	
13. Seattle, Wash.....	3,165	1,594	10	50	11,455	2,571	6,472	4,415	
14. Dallas, Tex.....	9,361	2,893	41	276	145,918	6,498	8,938	36,301	
15. Manila, P. I.....	1,892	345	12	52	21,995	1,547	1,875	1,051	
16. San Juan, P. R.....	1,647	1,035	10	84	35,523	612	850	944	
17. Honolulu, Hawaii.....	1,303	354	5	29	11,952	949	1,582	687	
18. St. Thomas, V. I.....	1,443	58	2	.....	1,161	385	801	64
Total.....	450,035	56,417	711	5,877	2,591,056	393,618	931,788	771,220	
SECOND, THIRD, AND FOURTH CLASS STATIONS.									
Albany, N. Y.....	3,030	256	.....	24	6,810	2,774	5,222	1,604
Apalachicola, Fla.....	138	30	.....	.....	363	108	209	.....
Ashland, Wis.....	177	74	.....	6	1,563	103	457	653
Ashabula, Ohio.....	505	51	.....	2	941	454	925	506
Astoria, Oreg.....	150	25	1	2	365	125	180	146	
Bangor, Me.....	8	.....	.....	.....	.....	8	10	48
Bay City, Mich.....	129	9	.....	1	98	120	228	179
Beaufort, N. C.....	334	42	.....	.....	588	292	655	65
Bellingham, Wash.....	268	13	.....	.....	468	255	633	320
Boothbay Harbor, Me.....	51	2	1	.....	222	39	69	21
Bridgeport, Conn.....	3	.....	.....	.....	66	1	1	1
Brunswick, Ga.....	114	26	1	.....	423	88	117	67
Burlington, Iowa.....	121	52	2	.....	979	69	133	392
Cairo, Ill.....	1,102	222	3	15	4,877	880	1,785	682	
Cambridge, Md.....	145	26	2	1	342	119	154	122	
Charleston, S. C.....	869	200	6	6	2,603	669	992	608	
Cincinnati, Ohio.....	13,388	1,025	20	100	22,819	12,363	30,147	16,238	
Cordova, Alaska.....	64	12	.....	1	192	52	52	2
Crisfield, Md.....	269	35	.....	.....	272	234	425	217
Duluth, Minn.....	378	117	1	2	2,074	261	302	548	
Eastport, Me.....	69	.....	.....	.....	.....	7	11	65
Edenton, N. C.....	.....	33	.....	.....	37	36	13	17
Elizabeth City, N. C.....	67	.....	.....	.....	.....	67	146	17

Erie, Pa.	411	115	1	6	1,603	296	909	546
Escanaba, Mich.	74	25	.....	.....	409	49	61	6
Eureka, Calif.	216	4	2	1	724	173	280	118
Fernandina, Fla.	21	2	.....	.....	38	19	43	.....
Gallipolis, Ohio	250	51	.....	.....	689	199	352	297
Galveston, Tex.	4,285	900	18	44	15,207	3,385	6,014	884
Georgetown, S. C.	26	1	.....	.....	2	25	34	9
Gloucester, Mass.	167	6	.....	.....	175	161	655	707
Grand Haven, Mich.	57	7	.....	.....	124	50	112	210
Green Bay, Wis.	318	141	5	13	5,172	177	287	582
Gulport, Miss.	79	17	.....	2	272	62	88	137
Hancock, Mich.	70	1	.....	.....	4	69	89	110
Hartford, Conn.	2	2	.....	.....	31	.....	.....	.....
Honolulu, Wash.	64	34	.....	.....	636	30	44	81
Irrington, Va.	11	.....	.....	.....	.....	11	15	24
Jacksonville, Fla.	1,370	294	3	14	4,037	1,076	2,673	1,585
Juneau, Alaska	102	33	.....	.....	620	69	199	55
Kansas City, Mo.	2,074	516	9	11	12,223	1,558	1,941	5,169
Ketchikan, Alaska	185	48	1	.....	560	137	391	63
La Crosse, Wis.	230	78	2	8	1,566	152	220	503
Lewes, Del.	115	1	.....	.....	5	114	232	39
Little Rock, Ark.	4,766	1,491	29	151	37,911	3,275	17,166	1,625
Los Angeles, Calif.	141	19	.....	1	244	122	17,277	7,695
Ludington, Mich.	45	.....	.....	.....	.....	45	83	138
Machias, Me.	45	.....	.....	.....	.....	45	83	138
Manistee, Mich.	73	14	.....	.....	449	59	82	142
Manitowoc, Wis.	150	40	.....	.....	510	110	211	227
Marquette, Mich.	155	24	1	.....	612	131	373	150
Marshfield, Ore.	9	9	.....	.....	192	272	.....	72
Menominee, Mich.	140	19	.....	.....	272	121	388	113
Milwaukee, Wis.	2,368	733	5	23	9,256	1,635	2,789	9,933
Nantucket, Mass.	46	.....	.....	.....	.....	46	151	19
Nashville, Tenn.	1,884	178	3	3	2,885	1,706	2,468	5,626
Natchez, Miss.	36	.....	.....	.....	.....	36	81	146
New Bedford, Mass.	2,065	57	2	4	1,014	2,008	2,159	3,006
Newbern, N. C.	163	116	1	10	1,981	47	59	13
New Haven, Conn.	15	4	.....	.....	51	11	14	48
New London, Conn.	290	102	3	6	2,089	188	267	460
Newport, Ark.	120	.....	.....	.....	.....	120	127	170
Newport, R. I.	12	1	.....	.....	13	11	28	11
Newport, Va.	201	31	1	2	561	170	271	96
Nome, Alaska	23	2	.....	.....	81	21	71	28
Norfolk, Va.	3,484	458	.....	15	5,314	3,026	4,245	3,583
Ogdensburg, N. Y.	55	31	3	18	3,906	24	32	775
Oswego, N. Y.	22	8	1	.....	348	14	18	12
Paducah, Ky.	1,837	76	.....	.....	1,401	1,761	3,692	1,948
Panama, Canal Zone.	1,363	761	9	20	13,042	602	808	243
Pensacola, Fla.	482	137	4	6	3,557	345	411	772
Perth Amboy, N. J.	274	34	.....	1	391	240	340	217
Petersburg, Alaska	22	6	.....	.....	132	16	34	5
Philadelphia, Pa.	8,403	801	22	39	15,048	7,602	17,444	2,725
Ponce, P. R.	56	14	1	1	193	42	59	3

TABLE II.—*Transactions at Marine and Public Health Service Hospitals, District Headquarters, and Relief Stations, fiscal year 1921—Continued*

Location.	SECOND, THIRD AND FOURTH CLASS STATIONS—Continued.						
	Total number of patients treated.	Total number treated in hospital.	Died.	Remaining in hospital June 30, 1921.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.
Port Angeles, Wash.	173	16		1	108	157	237
Port Arthur, Tex.	500	28			306	472	57
Port Huron, Mich.	407	35			568	372	1,257
Portland, Oreg.	5,143	1,008	16	71	19,099	4,138	1,193
Portsmouth, N. H.	5					5	8,125
Providence, R. I.	1,951	261	6	11	5,234	1,690	1
Provincetown, Mass.	60					60	2,853
Richmond, Va.	683	157	1	7	2,749	526	15,826
Rockland, Me.	65	5		1	77	60	177
Saginaw, Mich.	611	59	1	5	1,722	552	878
San Diego, Calif.	1,389	264	7	24	10,138	1,235	1,381
Sandusky, Ohio.	26	5				21	143
Sault Ste. Marie, Mich.	179	107	1	3	624	272	687
Seattle, Wash.	4,709	483	16	29	8,226	4,316	2,102
Seward, Alaska.	26	2				24	99
Sheboygan, Wis.	64	18		2	98	46	121
Solomons, Md.	179	9			61	170	9,524
South Bend, Wash.	71	23			285	48	21
Superior, Wis.	271	61		1	650	210	174
Tacoma, Wash.	1,441	207	4	13	2,696	1,234	201
Tampa, Fla.	4	1				3	58
Toledo, Ohio.	3,426	299	5	57	9,989	3,127	163
Unalakleet, Alaska.	14	3			146	11	48
Valdez, Alaska.	1					1	385
Wadsworth, Miss.	431	92		3	1,191	339	200
Washington, N. C.	40	3			22	37	1,722
Washington, N. C.	492	133	3	6	1,598	359	3
Wrangell, Alaska.	3					3	3,455
						1	1
						1	14
						523	225
						30	30
						509	395
						15	2
ARSENAL STATIONS.							
Atlanta, Ga.	203	1			30	202	622
Brooklyn, N. Y.	3,587	8			132	3,587	7,735
Curtis Bay, N. I.	22	11		17	77	271	3,034
Fort Wingate, N. Mex. ²	49					11	676
Jacksonville, Tenn. ²	489					49	155
Jeffersonville, Ind.	249					49	321
Muscle Shoals, Ala.	536	17	3		252	489	1,663
New Cumberland, Pa.	7					232	595
Rock Island, Ill.	2,732	37			91	529	711
					426	2,095	9,289

Savannah Proving Grounds, Ill.	42					42	77	129
South Amboy, N. J.	246					246	609	409
Coast Guard Stations.....						2,113	5,740	444
Total.....	93,214	13,103	229	826		259,301	80,111	112,350
Grand total.....	812,176	183,016	2,879	22,591		629,160	1,473,062	1,004,551

²Station closed.

TABLE 11-A.—Relief furnished at Marine and United States Public Health Service Hospitals, District Headquarters,¹ and other Relief Stations, fiscal year 1921, according to beneficiary.

Beneficiary.	Class of station.	Total number of patients treated.	Total number treated in hospital.	Died.	Remaining in hospital June 30, 1921.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number of physical examinations.
Grand total.....	All.....	812, 176	183, 016	2, 979	22, 591	7, 771, 671	629, 160	1, 473, 062	1, 004, 551
War Risk Insurance.....	First-class stations.....	161, 301	75, 949	1, 230	12, 893	3, 923, 381	85, 352	203, 169	77, 846
	Other relief stations.....	43, 526	6, 670	102	575	157, 168	36, 856	68, 757	78, 240
	District headquarters.....	399, 246	53, 874	673	5, 551	2, 532, 027	345, 372	851, 978	727, 826
	Total.....	604, 073	136, 493	2, 005	19, 019	6, 612, 576	467, 580	1, 123, 904	883, 912
American seamen.....	First-class stations.....	42, 664	12, 842	352	1, 560	547, 878	29, 822	65, 861	18, 156
	Other relief stations.....	27, 662	4, 493	102	175	73, 799	23, 169	58, 866	9, 799
	District headquarters.....	6, 665	1, 148	12	70	27, 509	5, 517	10, 152	2, 002
	Total.....	76, 991	18, 483	466	1, 805	649, 186	58, 508	133, 879	29, 957
Foreign seamen.....	First-class stations.....	864	832	19	41	25, 560	32	59	2, 936
	Other relief stations.....	579	191	.....	5	2, 509	388	1, 694	1, 392
	District headquarters.....	105	31	.....	1	703	74	145	145
	Total.....	1, 548	1, 054	19	47	28, 772	494	1, 895	4, 473
United States Coast Guard.....	First-class stations.....	3, 226	1, 274	8	97	36, 807	1, 952	3, 417	2, 162
	Other relief stations.....	4, 021	277	1	10	3, 693	3, 744	8, 857	2, 796
	District headquarters.....	294	62	.....	.....	942	232	340	426
	Total.....	7, 541	1, 613	9	107	41, 442	5, 928	12, 614	5, 384
United States Army.....	First-class stations.....	161	108	4	5	2, 091	53	93	78
	Other relief stations.....	519	42	.....	.....	462	477	968	81
	District headquarters.....	1, 906	104	.....	31	2, 795	1, 802	3, 740	625
	Total.....	2, 586	254	4	36	5, 348	2, 332	4, 801	784
United States Navy.....	First-class stations.....	218	173	13	19	7, 602	45	54	37
	Other relief stations.....	172	41	1	.....	613	131	277	42
	District headquarters.....	174	40	.....	5	629	134	442	57
	Total.....	564	254	14	24	8, 844	310	773	136

Mississippi River Commission.....	990	163	3	10	4,254	827	1,118	94
Other relief stations.....	243	31	.....	3	466	212	388	170
District headquarters.....	2	2	.....	.....	6	.....	.....	.....
Total.....	1,235	196	3	13	4,726	1,039	1,511	264
Engineers, United States Army.....	226	107	1	16	4,982	119	248	60
Other relief stations.....	619	136	3	7	2,178	483	900	95
District headquarters.....	97	33	1	2	547	64	119	14
Total.....	942	276	5	25	7,707	666	1,267	169
Lighthouse Service.....	532	163	3	19	4,716	369	610	73
Other relief stations.....	447	59	1	6	887	388	697	128
District headquarters.....	103	20	.....	1	474	83	162	52
Total.....	1,082	242	4	26	6,077	840	1,469	253
Coast and Geodetic Survey.....	97	36	1	.....	816	61	116	94
Other relief stations.....	194	42	.....	.....	425	152	233	151
District headquarters.....	42	7	.....	.....	147	35	77	69
Total.....	333	85	1	.....	1,388	248	426	314
Employees' Compensation Commission.....	15,490	1,871	19	143	51,073	13,619	37,912	5,601
Other relief stations.....	10,085	395	13	26	6,883	9,690	26,331	6,057
District headquarters.....	1,271	263	3	3	3,255	1,008	2,550	1,734
Total.....	26,846	2,529	35	172	61,311	24,317	66,793	13,392
Discharged allied soldiers.....	1,150	563	12	133	34,552	587	1,410	231
Other relief stations.....	338	110	5	3	3,225	228	557	560
District headquarters.....	367	100	4	22	5,375	267	426	469
Total.....	1,855	773	21	158	43,152	1,082	2,393	1,260
Immigration Service.....	16,447	16,415	325	584	195,049	32	35	117
Other relief stations.....	457	455	.....	15	5,280	2	2	3,921
District headquarters.....	7	1	.....	.....	1	6	11	800
Total.....	16,911	16,871	325	599	200,330	40	48	4,838
U. S. Public Health Service employees.....	3,067	1,598	30	102	30,338	1,469	3,749	1,113
Other relief stations.....	275	25	1	.....	279	250	306	247
District headquarters.....	2,415	318	12	106	10,667	2,097	4,112	2,971
Total.....	5,757	1,941	43	208	41,284	3,816	8,167	4,331

1 See note (1), Table II.

TABLE II-A.—*Relief furnished at Marine and United States Public Health Service Hospitals, District Headquarters, and other Relief Stations, fiscal year 1921, according to beneficiary.*—Continued.

Beneficiary.	Class of station.	Total number of patients treated.	Total number treated in hospital.	Died.	Remaining in hospital June 30, 1921.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number of physical examinations.
Federal Board for Vocational Education.....	First-class stations.....	16,866	1,210	8	152	30,562	15,656	22,273	3,822
	Other relief stations.....	3,424	136	.....	1	1,433	3,288	7,050	5,028
	District headquarters.....	36,518	412	.....	32	5,929	36,106	56,514	32,032
	Total.....	56,808	1,758	14	185	37,924	55,050	85,837	40,882
Miscellaneous.....	First-class stations.....	5,628	192	11	114	21,053	5,436	12,770	8,561
	Other relief stations.....	653	.....	.....	.....	.....	653	12,492	3,643
	District headquarters.....	823	2	.....	1	51	821	2,020	1,998
	Total.....	7,104	194	11	115	21,104	6,910	27,282	14,202
Grand total.....	First-class stations.....	268,927	113,496	2,039	15,888	4,921,314	135,431	352,394	120,981
	Other relief stations.....	93,214	13,103	229	826	259,301	80,111	188,380	112,350
	District headquarters.....	450,035	56,417	711	5,877	2,591,056	393,618	931,788	771,220
	Total.....	812,176	183,016	2,979	22,591	7,771,671	629,160	1,473,062	1,004,551

TABLE III.—Total number of hospital relief days furnished by the United States Public Health Service to each class of beneficiaries, by months, during the fiscal year 1921.

Beneficiaries.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
War Risk Insurance.....	470,839	482,904	490,707	522,322	519,272	560,227	602,598	523,495	604,957	602,195	620,580	603,670	6,612,576
American seamen.....	48,227	50,062	51,016	50,008	50,487	57,745	60,682	62,939	57,336	55,152	58,918	56,644	649,186
Foreign seamen.....	1,711	2,772	2,671	2,617	3,130	2,963	3,082	2,481	2,035	1,872	1,750	1,688	28,772
Coast Guard.....	3,250	3,242	2,873	3,013	2,727	3,014	4,082	3,747	4,370	3,966	3,938	3,220	41,442
United States Army.....	324	493	353	298	205	204	132	163	505	1,358	672	641	5,348
United States Navy.....	727	881	677	877	638	707	809	828	724	717	664	595	8,844
Mississippi River Commission.....	408	400	455	582	486	470	318	170	331	411	306	389	4,726
Engineers, United States Army.....	580	585	436	688	586	651	744	840	709	562	714	612	7,707
Lighthouse Service.....	447	493	414	310	306	534	573	487	648	547	678	640	6,077
Coast and Geodetic Survey.....	282	192	99	44	61	122	111	117	149	56	71	84	1,388
Employees' Compensation Commission.....	5,348	5,567	4,163	4,528	4,433	5,722	5,459	4,880	5,492	5,371	5,800	5,048	61,811
Discharged allied soldiers.....	1,827	2,062	2,219	2,460	2,622	3,342	3,781	4,507	4,955	5,011	5,433	4,933	43,152
Immigration Service.....	10,710	12,071	12,392	14,813	14,765	17,463	20,991	18,964	20,066	18,660	20,561	18,874	200,330
U. S. Public Health Service employees.....	1,457	1,464	1,265	1,729	1,680	2,257	3,878	3,151	6,251	6,664	5,760	5,728	41,284
Federal Board for Vocational Training.....	1,299	1,467	881	986	1,511	1,609	3,247	4,334	4,636	5,014	7,181	5,759	37,924
Miscellaneous.....	1,323	1,182	215	374	501	398	3,076	2,612	3,168	3,292	3,497	3,466	21,104
Total.....	556,759	564,807	570,836	605,649	603,410	657,328	713,563	623,715	716,042	710,848	736,523	711,991	7,771,671

TABLE IV.—Total number of out-patient treatments furnished by the United States Public Health Service to each class of beneficiaries, by months, during the fiscal year 1921.

Beneficiaries.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
War Risk Insurance.....	73,007	74,412	80,274	97,522	92,307	90,195	105,625	90,118	105,798	105,581	107,603	101,462	1,123,904
American seamen.....	11,343	11,633	10,578	9,583	9,682	10,050	10,166	9,583	11,694	9,301	15,134	14,102	133,879
Foreign seamen.....	215	167	126	261	194	168	109	33	21	43	253	218	1,898
Coast Guard.....	843	899	884	902	901	1,176	1,228	1,209	1,422	1,232	1,036	872	12,614
United States Army.....	104	70	31	32	29	12	257	387	466	1,171	1,232	1,010	4,801
United States Navy.....	87	35	33	37	28	13	23	34	234	87	89	63	4,773
Mississippi River Commission.....	67	124	68	96	115	84	163	87	103	148	239	215	1,511
Engineers, United States Army.....	75	89	100	167	147	98	85	87	138	89	94	57	1,267
Lighthouse Service.....	119	124	108	109	81	106	113	175	110	151	150	123	1,469
Coast and Geodetic Survey.....	37	22	38	21	35	50	45	53	27	46	34	18	426
Employees' Compensation Commission.....	3,808	3,691	3,433	3,395	3,259	5,087	7,364	5,853	7,656	8,233	7,683	7,331	66,793
Discharged allied soldiers.....	73	71	140	103	128	159	196	186	195	348	427	367	2,393
Immigration Service.....	4	3	5	5	4	6	5	3	3	13	.....	2	48
U. S. Public Health Service employees.....	163	209	212	175	339	433	531	638	1,537	1,620	1,542	768	8,167
Federal Board for Vocational Education.....	2,032	1,548	943	824	772	764	2,068	7,964	12,828	20,707	16,600	18,787	85,837
Miscellaneous.....	21	29	709	174	47	224	3,436	4,742	5,827	4,440	4,016	3,617	27,252
Total.....	92,028	93,123	97,680	113,706	108,068	108,625	132,214	121,183	148,081	153,210	156,132	149,012	1,473,062

TABLE V.—Total number of physical examinations furnished by the United States Public Health Service to each class of beneficiaries by months during the fiscal year, 1921.

Beneficiaries.	July.	August.	Septem-ber.	October.	Novem-ber.	Decem-ber.	January.	Feb-ruary.	March.	April.	May.	June.	Total.
War Risk Insurance.....	63,248	57,203	61,993	68,591	73,571	73,575	79,883	79,803	80,295	84,451	81,119	86,180	883,912
American seamen.....	2,269	2,816	1,957	2,109	1,850	1,427	1,413	1,893	4,176	2,941	3,395	3,811	29,957
Foreign seamen.....	369	449	340	496	396	493	278	183	184	431	341	513	4,473
Coast Guard.....	614	517	399	418	625	891	256	226	307	364	500	267	5,384
United States Army.....	10	14	10	3	2	2	9	43	84	107	189	311	784
United States Navy.....	5	2	2	1	1	2	5	15	25	24	29	25	136
Mississippi River Commission.....	12	14	17	25	10	17	49	15	32	10	22	41	264
Engineers, United States Army.....	6	6	3	6	7	10	13	30	19	31	22	16	169
Lighthouse Service.....	13	20	17	18	20	26	18	21	30	23	29	18	253
Coast and Geodetic Survey.....	29	16	23	2	27	21	9	16	79	35	32	25	314
Employees' Compensation Commission.....	582	522	583	970	1,138	598	1,176	1,063	1,061	1,795	1,482	2,422	13,392
Discharged Allied soldiers.....	12	11	23	23	35	42	65	72	201	326	244	206	1,260
Immigration Service.....	182	52	53	50	153	124	291	460	753	855	1,086	779	4,858
United States Public Health Service em- ployees.....	35	17	29	39	67	65	174	202	1,238	918	735	812	4,331
Federal Board for Vocational Training.....	988	191	165	185	165	133	760	4,084	7,210	9,357	8,923	8,721	40,882
Miscellaneous.....	632	464	314	478	314	348	1,481	1,501	1,939	2,370	2,000	2,361	14,202
Total.....	69,006	62,314	65,928	73,414	78,381	77,774	85,880	83,627	97,633	104,038	100,048	106,508	1,004,551

TABLE VI.—Number of War Risk Insurance¹ and other beneficiaries² admitted, discharged, and died each month and the number remaining at the end of each month—Service and contract hospitals, United States Public Health Service—Fiscal year, 1921.

Month.	Admitted.			Discharged.			Died.			Remaining.	
	War Risk Insurance.	Others.	Total.	War Risk Insurance.	Others.	Total.	War Risk Insurance.	Others.	Total.	War Risk Insurance.	Total.
1920.											
July.....	9,525	3,370	12,895	8,792	3,295	12,087	110		154	16,551	18,985
August.....	8,827	3,681	12,518	8,227	3,498	11,725	116		160	17,045	19,568
September.....	8,585	3,465	12,050	7,784	3,296	11,080	119		169	17,727	20,369
October.....	9,306	3,345	12,651	8,570	3,159	11,729	131		194	18,332	21,097
November.....	8,991	3,219	12,210	8,313	3,022	11,335	148		207	18,862	21,765
December.....	9,535	3,936	13,471	9,413	3,544	12,957	167		256	18,817	22,023
1921.											
January.....	12,279	4,161	16,440	10,658	3,747	14,405	200		319	20,238	23,739
February.....	10,402	3,459	13,861	11,093	3,213	14,306	194		352	19,353	22,942
March.....	11,341	3,917	15,258	10,911	3,880	14,791	234		356	19,549	23,053
April.....	10,984	3,996	14,910	10,155	3,718	13,873	199		375	20,179	23,816
May.....	10,806	3,910	14,716	11,048	3,705	14,753	208		285	19,729	23,484
June.....	9,974	3,781	13,755	10,505	3,900	14,405	179		243	19,019	22,591
Total.....	120,505	44,170	164,735	115,409	41,977	157,446	2,005		974	3 19,019	3 22,591

¹ See note (1), Table II, p. 333.² "Other beneficiaries" include patients of the Federal Board for Vocational Education.³ Total remaining at end of year.

TABLE VII.—*Relief furnished by the Public Health Service, by months, War Risk Insurance and "Other" beneficiaries, March, 1919, to July, 1921, inclusive.*

Month and year.	Hospital relief days.			Out-patient treatments.			Physical examinations.		
	War Risk Insurance.	Others. ¹	Total.	War Risk Insurance.	Others. ¹	Total.	War Risk Insurance.	Others. ¹	Total.
1919.									
March to June	47,982	233,300	281,282	6,371	32,700	39,071	9,616	10,300	19,916
July	108,520	46,286	154,806	3,659	16,252	19,911	9,678	4,002	13,680
August	139,974	43,436	183,410	5,825	14,736	20,561	12,025	4,535	16,560
September	157,895	53,996	211,891	9,481	16,852	26,333	16,045	4,259	20,304
October	188,120	61,997	250,117	24,728	15,711	40,439	20,343	3,704	24,047
November	222,558	62,701	285,259	27,512	14,297	41,809	23,235	3,318	26,553
December	242,827	70,459	313,286	29,921	15,470	45,391	25,750	3,517	29,267
1920.									
January	314,239	80,400	394,639	40,282	16,863	57,145	34,596	4,031	38,727
February	318,166	78,785	396,951	44,356	15,586	59,942	26,642	3,522	30,164
March	377,490	82,397	459,887	45,642	18,749	64,391	39,770	4,451	44,221
April	376,917	69,460	446,377	56,116	17,480	73,596	46,401	4,997	51,398
May	433,138	71,475	504,613	74,700	18,453	93,153	47,153	5,586	52,739
June	469,571	75,551	545,122	87,663	18,960	106,623	55,014	6,601	61,615
Total (fiscal year 1920)	3,349,415	801,923	4,151,338	449,885	199,339	649,224	356,652	52,523	409,175
1921.									
July	479,839	76,920	556,759	73,007	19,021	92,028	63,248	5,758	69,006
August	482,904	81,903	564,807	74,412	18,711	93,123	57,203	5,111	62,314
September	490,707	80,129	570,836	80,274	17,406	97,680	61,993	3,935	65,928
October	522,322	83,327	605,649	97,522	16,184	113,706	68,591	4,823	73,414
November	519,272	84,138	603,410	92,307	15,761	108,068	73,571	4,810	78,381
December	560,327	97,201	657,528	90,195	18,430	108,625	73,575	4,199	77,774
January	602,598	110,985	713,583	105,625	26,589	132,214	79,883	5,997	85,880
February	624,495	100,220	724,715	90,118	31,065	121,183	73,803	9,824	83,627
March	604,467	111,375	715,842	105,798	42,283	148,081	80,285	17,633	97,918
April	602,185	108,653	710,838	105,581	47,629	153,210	84,451	19,587	104,038
May	620,380	115,943	736,323	107,603	48,529	156,132	81,119	18,929	100,048
June	603,670	108,321	711,991	101,462	47,550	149,012	86,180	20,328	106,508
Total ² (fiscal year 1921)	6,612,576	1,159,095	7,771,671	1,123,904	349,158	1,473,062	883,912	120,639	1,004,551
Grand total (28 months)	10,009,973	2,194,318	12,204,291	1,580,160	581,197	2,161,357	1,250,180	183,462	1,433,642

¹ "Others" include beneficiaries of the Federal Board for Vocational Education.² Relief furnished by district supervisors during the entire year is included. Pursuant to an order of the Secretary of the Treasury dated April 19, 1921, the activities of district supervisors were transferred to the Bureau of War Risk Insurance. This transfer was in process during the months of May and June, 1921.

PERSONNEL AND ACCOUNTS DIVISION.

The work in the Division of Personnel and Accounts during the fiscal year has continued heavy on account of the large number of personnel engaged in the examination and treatment of beneficiaries of the Bureau of War Risk Insurance, and, furthermore, by the large expenditures rendered necessary by the enlarged activities of the service.

The activities of the Hospital Division were increased during the year and this necessarily threw additional work on the Division of Personnel and Accounts. In addition to the officers of the regular corps, it became necessary to commission and place on active duty a large number of officers in the reserve in order that the responsibilities of the service could be met.

It also became necessary to increase the number of special disbursing officers in the field in order that the personnel in the hospitals and other stations could be promptly paid. This has proven a wise procedure, as nothing is so conducive to engendering a spirit of content among personnel as a prompt payment of salaries when due.

The section of finance and accounts has been reorganized during the fiscal year and an up-to-date bookkeeping system and careful check of expenditures have been instituted. The operation of service stations under a definite allotment was given a preliminary trial during the last few months of the fiscal year in order that satisfactory adjustments might be made and a definite procedure tried. This matter was so adjusted that the finance and accounts section of this division was able on the 1st of July to place into effect a definite allotment system, which it is believed will be of considerable advantage to the service and will place this section on a thorough business basis.

During the year a subsection of accounting was formed, and the work of this nature which was formerly carried out in the Hospital Division was taken over.

Owing to the marked increase in activities of the service and the establishment of the finance and accounts section on a more definite basis, it became necessary to increase the number of clerical personnel in this division in order that the work might be promptly and expeditiously handled.

COMMISSIONED MEDICAL OFFICERS.

There has been no marked change in the number of officers in the regular commissioned corps, as those entering balanced the resignations. During the year eight were commissioned as assistant surgeons, and there were six resignations, consisting of two passed

assistant surgeons and four assistant surgeons. There were also two resignations and one death among the pharmacists.

Nine officers were placed on waiting orders, as follows:

One Assistant Surgeon General at Large.

Five senior surgeons.

Two surgeons.

One passed assistant surgeon.

A total of 9, which added to the 8 formerly on waiting orders makes a grand total of 17. The placing of these officers on waiting orders created vacancies for the promotion of five surgeons to the grade of senior surgeon. The regular commissioned corps of the service at the close of the fiscal year consists of the Surgeon General, 4 Assistant Surgeon Generals at Large, 21 senior surgeons, 78 surgeons, 57 passed assistant surgeons, and 29 assistant surgeons. Two senior surgeons and five surgeons were detailed to the bureau as Assistant Surgeon Generals in accordance with the act of July 1, 1902. One Assistant Surgeon General at Large was assigned in charge of the general inspection service, and another was placed in charge of the enforcement, in Europe, of outgoing quarantine measures against the introduction of communicable diseases into the United States. The third was placed in charge of important activities on the Pacific coast.

RESERVE MEDICAL OFFICERS.

Owing to the necessity for an additional number of hospitals and beds for the care and treatment of beneficiaries of the Bureau of War Risk Insurance, it became necessary to practically double the number of reserve officers on active duty in order to meet the enlarged activities of the service. At the commencement of the fiscal year there were 485 on active duty and at the close of the year it had become necessary to increase the number to 966. These officers were serving under their commission in the following grades: One Assistant Surgeon General, detailed as chief medical officer, Federal Board for Vocational Education, and 1 as executive officer of the inspection service; 16 senior surgeons, 342 surgeons, 455 passed assistant surgeons, and 151 assistant surgeons.

The law which made the reserve personnel available for duty in the hospitals of the service and offices for the treatment of beneficiaries of the Bureau of War Risk Insurance has enabled the service to meet its added responsibilities in providing care and treatment for this class of patients, and as this corps is elastic it can be filled by recruiting officers who performed duty in the Army during the World War and whose services were no longer required after the termination of hostilities. It would have been impossible for the service, with the small regular corps, to have provided the necessary medical personnel to treat the patients entrusted to its care.

As stated above, there were six resignations during the year, and all these officers left the service to accept more lucrative positions.

ATTENDING SPECIALISTS.

There was little change in the number of attending specialists, as there were only 863 on duty at the close of the fiscal year in com-

parison with 807 at the beginning of the year. These highly trained officers on part-time duty have proved to be of great value to the service in furnishing expert diagnosis and treatment of obscure cases, and with these specialists making regular visits to the hospitals, there is now provided as scientific and expert medical care in the Public Health Service hospitals to-day as in the best private institution.

ACTING ASSISTANT SURGEONS.

It was necessary to increase the number of acting assistant surgeons from 1,511, at the beginning of the fiscal year, to 1,679 at the close. This increase was necessitated by the opening of additional hospitals and the operation of large dispensaries which were equipped and opened during the year in large centers for the examination and treatment of beneficiaries of the Bureau of War Risk Insurance.

COLLABORATING EPIDEMIOLOGISTS.

The expenditure incident to the appointment of health officers as collaborating epidemiologists has proven its value, as more prompt and accurate reports of the prevalence of communicable diseases are now received. The compensation is nominal, and more valuable returns are received with little cost to the Government. During the year, the number of collaborating epidemiologists was increased to 36 and the assistant collaborating epidemiologists from 2,803 to 3,862.

Assignments.—The following changes in the assignment of the regular commissioned corps were made during the year: Twenty-eight were detailed to Public Health Service hospitals; 8 to immigration stations; 16 to quarantine stations; 6 to plague eradication activities; 2 for duty in foreign ports; 4 as supervisors of the War Risk Insurance districts; 1 as chief quarantine officer, Panama Canal Zone; 1 to the Hygienic Laboratory; 2 to the bureau; and 1 in charge of the leprosy station, Hawaiian Islands.

NOTE.—On July 1, 1921, there were detailed to the Bureau of War Risk Insurance for duty in the supervisors' districts 237 reserve officers, 940 acting assistant surgeons, and 541 attending specialists.

HYGIENIC LABORATORY.

During the fiscal year 1921 there has been no noteworthy change in the character of the work accomplished in the Hygienic Laboratory nor in the personnel engaged.

At the close of the fiscal year there were on duty in the Hygienic Laboratory, in addition to the director and assistant director, 3 chiefs of divisions, 4 surgeons, 3 passed assistant surgeons, 1 assistant surgeon, 2 pharmacists, 5 technical assistants. 1 physiologist, 3 special experts, 2 pharmacologists, 1 assistant pharmacologist, 2 scientific assistants, 2 chemists, 1 chemical laboratorian, 2 bacteriologists, 2 sanitary bacteriologists, 1 artist, 15 other technical employees, and 75 attendants and other employees.

FIELD INVESTIGATIONS OF PUBLIC HEALTH.

Following is a statement showing the personnel engaged in the various activities carried out in accordance with the act of Congress

approved August 14, 1912, which authorizes the service to study and investigate the diseases of man and conditions influencing the propagation and spread thereof:

STUDIES OF RURAL SANITATION.

(Headquarters, Washington, D. C.)

Athens, Ga.

Field Agent J. D. Applewhite.

Brunswick, Ga.

Field Agent R. L. Desaussure.

Cape Cod District, Mass.

Field Agent Russell B. Sprague.

Clayton, N. Mex.

Field Agent C. H. Douthirt.

Dubuque, Iowa.

Field Agent D. C. Steelsmith.

Fayetteville, N. C.

Field Agent Earnest Larkin.

Florence, Ala.

Field Agent W. H. Abernethy.

Great Falls, Mont.

Field Agent N. J. Dolan.

Gulfport, Miss.

Scientific Asst. D. I. Williams.

Huntsville, Ala.

Field Agent Carl A. Grote.

Jasper, Ala.

Field Agent A. M. Waldrop.

Joplin, Mo.

Asst. Surg. Thomas Parran, jr.
 Acting Asst. Surg. J. C. Montgomery.
 Acting Asst. Surg. U. F. Kerr.

Joplin, Mo.—Continued.

Acting Asst. Surg. J. T. Wharton.
 Scientific Asst. H. S. Lucas.

Lafayette, Ga.

Field Agent J. A. Johnston.

Las Vegas, N. Mex.

Field Agent M. D. Moran.

Maysville, Ky.

Field Agent B. F. Reynolds.

Taliedega, Ala.

Field Agent J. H. Hill.

Tarboro, N.C.

Field Agent G. M. Anderson.

Virginia (State of).

Surg. W. F. Draper.
 Scientific Asst. G. S. Bote.
 Scientific Asst. E. C. Stoy.
 Associate Epidemiologist J. W. Cox.
 Field Agent W. R. Culbertson.
 Field Agent T. J. Robinson.

Woodstalk, Vt.

Field Agent C. W. Kidder.

Rural sanitation supervision.

Surg. L. L. Lumsden, in charge studies
 of rural sanitation.
 Passed Asst. Surg. K. E. Miller.
 Associate Epidemiologist C. C. Apple-
 white.
 Associate Epidemiologist W. K. Sharp,
 jr.
 Acting Asst. Surg. F. T. Foard.

MALARIA.

(Headquarters, Memphis, Tenn.)

Surg. L. D. Fricks (in charge).

Albany, Ga.

Asst. Sanitary Engineer J. G. Foster.
 Junior Asst. Sanitary Engineer H. N.
 Old.

Austin, Tex.

Junior Asst. Sanitary Engineer L. G. Lenert.

Columbia, S. C.

Associate Sanitary Engineer L. M. Fisher.

Jackson, Miss.

Asst. Sanitary Engineer W. H. W.
Komp.

Lake Charles, La.

Asst. Sanitary Engineer Frank R.
Shaw.

Memphis, Tenn.

Surg. L. D. Fricks (in charge).
Special Expert M. A. Barber.
Acting Asst. Surg. C. P. Coögle.

Memphis, Tenn.—Continued.

Acting Asst. Surg. William Krause.
Associate Sanitary Engineer A. W.
Fuchs.
Technical Asst. Theo. B. Hayne.
Pharmacist L. G. Smith.

Montgomery, Ala.

Asst. Sanitary Engineer J. C. Carter.

Norfolk, Va.

Epidemiologist T. H. D. Griffiths.

MORBIDITY STATISTICS.

(Headquarters, Washington, D. C.)

Surg. W. H. Frost (in charge).
Statistician Edgar Sydenstricker.

Statistical Expert Dean K. Brundage.

PELLAGRA.

(Headquarters, Washington, D. C.)

Surg. Joseph Goldberger (in charge).

Spartanburg, S. C.

Passed Asst. Surg. G. A. Wheeler.
Scientific Asst. G. A. Decell.

Milledgeville, S. C.

Passed Asst. Surg. W. F. Tanner.

PUBLIC HEALTH ADMINISTRATION.

Passed Asst. Surg. C. E. Waller, State health officer, Albuquerque, N. Mex.

CHILD HYGIENE.

(Headquarters, Washington, D. C.)

Surg. T. Clark (in charge).
Passed Asst. Surg. L. C. Weldon.

State of Delaware, Wilmington.

Acting Asst. Surg. Gilbert S. Osincup.

State of Maryland, Baltimore.

Acting Asst. Surg. E. Blanche Sterling.

State of Mississippi, Hattiesburg.

Acting Asst. Surg. Harry B. Butler.

State of Mississippi, Jackson.

Acting Asst. Surg. Edith B. Lowry.

State of Missouri, Jefferson City.

Passed Asst. Surg. C. P. Knight.
Acting Asst. Surg. Minerva M. Knott.
Acting Asst. Surg. Viola Russell.

Consultants in child hygiene.

Dr. S. Josephine Baker, New York,
N. Y.
Dr. McClinock Hamill, Philadelphia,
Pa.
Dr. L. Emmett Holt, New York, N. Y.
Dr. J. P. Sedgwick Holt, Minneapolis,
Minn.
Dr. Fritz Talbot, Boston, Mass.

SEWAGE DISPOSAL.

(Headquarters, Washington, D. C.)

Prof. Charles W. Stiles, in charge.

*Fort Caswell, N. C.*Associate Sanitary Engineer H. R. Crohurst.
Bacteriologist C. L. Pfau.*Consultants on Sewage Disposal Board.*Consulting Engineer G. C. Whipple,
Cambridge, Mass.*Consultants on Sewage Disposal Board—Continued.*Consulting Hygienist Edwin O. Jordan, Chicago, Ill.
Consulting Hygienist W. S. Rankin, Raleigh, N. C.
Consultant E. B. Phelps, New York, N. Y.
Consultant Victor C. Vaughn, Ann Arbor, Mich.
Lieut. Col. Charles F. Craig, Medical Corps, United States Army, Washington, D. C.

STREAM POLLUTION.

(Headquarters, Cincinnati, Ohio.)

Baltimore, Md.

Surg. W. H. Frost, in charge.

*Cincinnati, Ohio.*Associate Sanitary Engineer R. E. Tarbett.
Pharmacist F. J. Herty.
Asst. Chemist Emory J. Theriault.
Bacteriologist Chester T. Butterfield.
Associate Sanitary Engineer H. W. Streeter.*Cincinnati, Ohio—Continued.*Associate Sanitary Engineer H. H. Wagenhals.
Special Expert W. C. Purdy.*Peoria, Ill.*Associate Sanitary Engineer J. K. Hoskins.
Pharmacist J. V. La Grange.

INDUSTRIAL SANITATION.

(Headquarters, Washington, D. C.)

Surg. L. R. Thompson, in charge.
Passed Asst. Surg. Edward C. Ernst.
Passed Asst. Surg. R. C. Williams.
Asst. Sanitarian (R) Wm. G. Beudler, executive officer.
Acting Asst. Surg. John A. Turner.
Acting Asst. Surg. William J. McConnell.
Asst. Sanitary Chemist A. B. Hastings.
Asst. Chemist Harry W. Houghton.
Asst. Chemist Frederick B. Flinn.
Asst. Statistician Frank M. Phillips.
Acting Asst. Surg. O. M. Spencer.
Scientific Asst. Gobin Stair.
Scientific Asst. Norris P. Bryan.Scientific Asst. Leonard Greenburg.
Acting Asst. Surg. Albert S. Gray.
Acting Asst. Surg. James F. Rogers.
Scientific Asst. Edward M. Martin.
Acting Asst. Surg. Thomas P. O'Brien.*Part-time personnel.*Consulting Physiologist Frederic S. Lee.
Consulting Hygienist C. E. A. Winslow.
Consultant in Industrial Hygiene Bernard J. Newman.
Associate Physiologist A. H. Ryan.
Scientific Asst. P. S. Florence.

TRACHOMA.

*Louisville, Ky. (headquarters).*Surg. John McMullen, in charge.
Acting Asst. Surg. James E. Smith.*Greenville, Ky.*

Acting Asst. Surg. Joe C. Johnston.

Jackson, Ky.

Acting Asst. Surg. F. G. Ellis.

La Moure, N. Dak.

Acting Asst. Surg. Clarence E. Downes.

*Pikeville, Ky.*Acting Asst. Surg. Russell W. Raynor.
Acting Asst. Surg. J. Allen Eldridge.*Morristown, Tenn.*

Passed Asst. Surg. (R) Joseph L. Goodwin.

BOTULISM.

Epidemiologist J. C. Geiger (special duty in California.)

LEPROSY INVESTIGATIONS.

(Headquarters, Honolulu, Hawaii.)

Passed Asst. Surg. H. E. Hasseltine, in charge.

PHARMACISTS AND ADMINISTRATIVE ASSISTANTS.

Owing to the small number of pharmacists it became necessary, at the beginning of the present fiscal year, to supplement this small corps through the appointment of administrative assistants, as provided in the service regulations approved August 29, 1920. Following the merger of the pharmacists corps with the administrative corps in accordance with the provisions of the regulations whereby readjustments of salaries and allowances were accomplished, the administrative corps continued to function as such to and including June 30, 1921. At the close of the fiscal year the administrative corps consisted of 38 former pharmacists and 130 administrative assistants, the latter group having been appointed subsequent to July 1, 1920. Amendments to the service regulations provided for the reestablishment of the Corps of Pharmacists, effective July 1, 1921, and for the continuance of the administrative corps as a separate group on and after that date.

At the beginning of the fiscal year there were on duty 42 pharmacists, divided as follows: Pharmacists of the first class, 29; second class, 13. Two pharmacists of the first class resigned and 2 pharmacists of the first class were appointed associate medical purveyors in the United States Public Health Service (R), which left, at the close of the fiscal year, 38 pharmacists on duty as follows: Pharmacists of the first class, 25; second class, 13. At the close of the fiscal year there were on duty 130 administrative assistants, divided by group as follows:

Chief administrative assistant.....	9
Administrative assistant, first class.....	16
Administrative assistant, second class.....	55
Administrative assistant, third class.....	49
Total.....	129

BOARDS CONVENED.

Fifty-eight boards were convened at various stations throughout the United States for the physical examination of officers of the Coast Guard and applicants for entrance therein; 1 for the physical examination of detained aliens; 13 for the examination of commissioned officers to determine their fitness for promotion to the next higher grades of the service; 10 for examination of applicants for appointment as assistant surgeons; 1 to consider the possible utilization of certain hospital sites; 3 to survey hospital equipment; 2 to determine the eligibility of a commissioned officer of the service to be placed on waiting orders; 1 for the physical examination of a claimant for Federal compensation; 2 for the physical examination of patients at

hospitals; 1 to investigate loss of property at a service hospital; 1 to report on the adoption of a suitable blank form to be used in the preparation of daily ward reports at hospitals; 1 to conduct physical examinations of graduating classes of cadets, United States Coast Guard; 5 for the physical examinations of employees in the United States Coast Guard; 2 for the physical examination of officers of the Coast and Geodetic Survey; 1 to consider and report on the adoption of a standard list of dental equipment and supplies; 1 to consider and recommend the classification of administrative assistants, other than former pharmacists; 1 to consider and recommend the classification of the scientific personnel of the service; 1 for the purpose of recommending certain administrative assistants for promotion to the grade of chief administrative assistant.

The sanitary board has been convened in three sessions to pass upon reports of inspection of establishments engaged in the manufacture of vaccines, serums, toxins, etc., prior to recommending a license and to pass upon advertised remedies and appliances to determine if said advertisements should be excluded from the mails.

The following table shows the numerical distribution of the entire personnel of the service by designation and activity as of June 30, 1921:

Numerical distribution of personnel of Public Health Service by designation and activity as of June 30, 1921.

Activity.	Regular corps.	Reserve corps.	Acting Assistant surgeons.	Attending specialists.	Internes.	Administrative assistants.	Pharmacists.	Scientific personnel.	Attendants and clerks.	Collaborating epidemiologists.	Total.
Divisions of the bureau.	19	48					2				69
Hospitals and dispensaries.	66	650	332	322	65	122	25	2,340	10,074		13,996
Quarantine and immigration.	56		131			4	5	12	728		936
Veneral disease control.			60								60
Epidemic.	7		2					20	440	3,898	4,367
Field investigations of public health.	35		33				6	42	308		424
Hospital construction.									1,640		1,640
Purveying service.	1	4				3			415		423
Bureau of War Risk Insurance.		237									237
Federal Board for Vocational Education.		6									6
Second and third class stations.		14	116			1			126		257
United States Coast Guard.		7	5								12
Waiting orders	17										17
Total.	201	966	679	322	65	130	38	2,414	13,731	3,898	22,444

DIVISION OF VENEREAL DISEASES.

The third year of venereal-disease control activities has followed the same general lines of medical measures, education, and law enforcement contained in the nation-wide program outlined in 1918. With the decrease in the amount of the Federal appropriation, the initiation of activities and their direction have been assumed more largely by the States. The work of the division has been to coordinate and standardize the activities in the country at large, to help in the solution of State and interstate problems, and through study and experiment to determine the practicability and efficacy of the various measures employed.

In spite of the decrease in the Federal allotments to the States, the work as a whole has progressed. That it is winning the confidence and support of the people is shown by their activity in securing local funds to keep the clinics open and the work alive and by the passage of laws or regulations in 39 States which provide funds and secure to the people of these States more adequate protection from the spread of venereal diseases.

FEDERAL AND STATE APPROPRIATIONS.

At the close of the fiscal year 1920, 46 States had secured funds from State sources, required by law, to entitle them to the Federal allotment. Nevada, New Mexico, and the District of Columbia only failed to secure any of the amount apportioned to them. For the year 1921 the amount available to the States from Federal funds was decreased from \$1,000,000 to \$546,345.30. Again 46 States qualified. Idaho, Nevada, and the District of Columbia failed to receive their allotments, but Nevada adopted the regulations promulgated in 1918 by the Secretary of the Treasury and has funds available for undertaking the work in 1922. Idaho also has a legislative appropriation available for 1922 so that its Federal allotment may be secured.

A statement of the 1921 allotments to States with the amount disbursed and the balance due on June 30, 1921, follows:

Statement of the 1921 Federal allotment to States.

State.	Total allotment.	Amount paid to States as of June 30, 1921.	Balance due States as of June 30, 1921.
United States.....	\$546,345.30	\$274,213.37	\$272,131.93
Alabama.....	12,700.97	12,700.97	.....
Arizona.....	1,213.93	.....	1,213.93
Arkansas.....	9,352.75	.....	9,352.75
California.....	14,123.42	11,345.12	2,778.30
Colorado.....	4,746.46	4,322.64	423.82
Connecticut.....	6,622.02	5,491.28	1,130.74
Delaware.....	1,201.86	631.27	570.59
District of Columbia.....	1,966.66	.....	1,966.66
Florida.....	4,470.80	4,470.80	.....
Georgia.....	15,499.03	3,285.53	12,213.50
Idaho.....	1,934.13	.....	1,934.13
Illinois.....	33,495.07	28,186.86	5,308.21
Indiana.....	16,044.09	13,285.58	2,758.51
Iowa.....	13,215.86	11,143.03	2,072.83
Kansas.....	10,044.79	5,606.00	4,438.79
Kentucky.....	13,602.78	.....	13,602.78
Louisiana.....	9,839.49	2,124.39	7,715.10
Maine.....	4,409.92	4,409.92	.....
Maryland.....	7,694.78	6,404.61	1,290.17
Massachusetts.....	19,997.61	.....	19,997.61
Michigan.....	16,693.35	10,865.90	5,827.45
Minnesota.....	12,330.39	12,330.39	.....
Mississippi.....	10,675.45	5,010.15	5,665.30
Missouri.....	19,563.49	.....	19,563.49
Montana.....	2,233.87	1,515.37	718.50
Nebraska.....	7,082.14	2,989.01	4,093.13
Nevada.....	486.36	.....	486.36
New Hampshire.....	2,557.74	1,329.77	1,227.97
New Jersey.....	15,071.60	13,667.72	1,403.88
New Mexico.....	1,944.28	.....	1,944.28
New York.....	54,137.84	32,264.86	21,872.98
North Carolina.....	13,106.06	5,602.67	7,503.39
North Dakota.....	3,427.90	2,417.77	1,010.13
Ohio.....	28,318.26	17,733.27	10,584.99
Oklahoma.....	9,844.04	9,074.11	769.93
Oregon.....	3,996.44	.....	3,996.44
Pennsylvania.....	45,533.26	.....	45,533.26
Rhode Island.....	3,223.28	.....	3,223.28
South Carolina.....	9,001.97	9,001.97	.....
South Dakota.....	3,468.48	2,348.06	1,120.42
Tennessee.....	12,978.36	.....	12,978.36
Texas.....	23,146.73	4,224.96	18,921.77
Utah.....	2,217.83	1,454.64	763.19
Vermont.....	2,114.50	234.99	1,879.51
Virginia.....	12,246.65	9,911.21	2,335.44
Washington.....	6,783.79	6,783.79	.....
West Virginia.....	7,253.85	5,571.40	1,682.45
Wisconsin.....	13,863.89	5,606.28	8,257.61
Wyoming.....	867.08	867.08	.....

No appropriation was made by Congress for allotment to the States in 1922. Continuation of the work will, therefore, be dependent upon funds from local sources and the unexpended balance of the 1921 Federal appropriation. This means that the States will have to double their efforts if their work is to continue upon the same scale as in the past. The outlook is encouraging, however, when it is considered that 46 States have made some provision for carrying on the work. Legislative appropriations have been made in 36 States during the past year. The amount and the period of time covered by the appropriation in each State follows:

Arizona (venereal disease control, two years).....	\$6,000.00
Arkansas (venereal disease control, two years).....	25,000.00
California (venereal disease control, two years).....	51,600.00
Colorado (venereal disease control, annually).....	20,000.00
Colorado (State home to treat venereal disease infected women) --	25,000.00

Connecticut (venereal disease control, two years)-----	20,000.00
Idaho (venereal disease control, two years)-----	5,000.00
Iowa (venereal disease control, two years)-----	50,000.00
Illinois (venereal disease control, two years)-----	200,000.00
Indiana (venereal disease control, two years)-----	84,000.00
Indiana (venereal disease control purposes, period ending Oct. 1, 1921)-----	25,000.00
Kansas (venereal disease control, two years)-----	20,000.00
Maine (venereal disease control, one year)-----	10,000.00
Massachusetts (venereal disease control, one year)-----	42,536.00
Michigan (venereal disease control, two years)-----	103,000.00
Minnesota (venereal disease control, two years)-----	60,000.00
Missouri (venereal disease control, two years)-----	19,000.00
Montana (for 28 months ending June 30, 1923)-----	11,070.00
Nebraska (venereal disease control, two years)-----	32,740.00
New Jersey (venereal disease control, one year)-----	35,000.00
New Hampshire (venereal disease control, annually)-----	6,000.00
New Mexico (venereal disease control, one year)-----	1,944.00
New York (venereal disease control, one year)-----	102,980.00
North Carolina (venereal disease control, two years)-----	34,318.18
North Dakota (venereal disease control, two years)-----	12,548.48
Ohio (venereal disease control, one year)-----	25,000.00
Oklahoma (venereal disease control, two years)-----	15,500.00
Oregon (detention hospital, two years)-----	60,000.00
Oregon (Oregon Social Hygiene Society, two years)-----	30,000.00
Pennsylvania (venereal disease control, one year)-----	300,000.00
Rhode Island (venereal disease control, annually)-----	5,000.00
South Carolina (venereal disease control, one year)-----	33,886.00
South Dakota (venereal disease control, two years)-----	12,000.00
Tennessee (venereal disease control, two years)-----	25,956.00
Utah (venereal disease control, two years)-----	3,600.00
Vermont (venereal disease control, two years)-----	8,000.00
West Virginia (venereal disease control, two years)-----	10,000.00
Wisconsin (venereal disease control, two years)-----	82,500.00
Wyoming (venereal disease control, two years)-----	8,600.00
Total-----	1,623,378.66

The following States had no legislative sessions in 1921, but venereal disease control work was provided for at the 1920 session:

Alabama.
Georgia.
Kentucky.
Louisiana.

Maryland.
Mississippi.
Virginia.

No regular appropriation was made by Nevada, but the sum of \$486.36, the equivalent of the Federal allotment for 1921, has been set aside.

Delaware has an annual appropriation of \$2,500 available for venereal disease control work.

Health activities are taken care of in Florida by a mileage tax from which appropriation is made for this work. In 1921 the tax for health work was cut in half. The sum of \$5,000, however, has been made available for venereal disease control work in 1922.

The legislatures in both Washington and Texas failed to make any appropriation for this work. The District of Columbia also has no funds available for this purpose.

The appropriation of \$200,000 to cover the expenses of the division in 1922 was continued by Congress.

DIVISION PERSONNEL.

Asst. Surg. Gen. C. C. Pierce has continued in charge of the Division of Venereal Diseases throughout the year, assisted by two sec-

tion chiefs. Other members of the office force have been an administrative assistant, a nurse, 9 assistant directors of educational work, an artist, a financial clerk, a statistician, librarian, 2 file clerks, 11 stenographers, 4 typists, 3 clerks, a multigraph operator, and 4 messengers: a total office personnel of 43.

The field personnel has consisted of the following: Sixty acting assistant surgeons, 11 scientific assistants, 12 regional consultants, 4 lecturers, a special consultant, an abstractor and correspondent, 2 stenographers, a nurse, a bacteriologist; a total field personnel of 93.

MEDICAL MEASURES.

In spite of the decrease in the Federal appropriation to the States, progress has been made in the field of medical activities. The increase in the number of clinics operating is not great, but a larger proportion are making regular monthly reports. More examinations and treatments per person admitted are being given by the clinics, showing more thorough work done. There is also an increase shown in the number of cases of venereal disease reported to State Boards of Health. The outstanding feature of the medical work as of the educational work of the division has been the Institute on Venereal Disease Control and Social Hygiene held in November, 1920, which gave health officers, clinicians, doctors, and social workers an opportunity to study the best modern methods of diagnosis and treatment and clinic administration in a scientific way.

CLINICS.

New clinics established.—During the year 1921, 644 clinics have been in operation, of which 483 have been under the joint control of the State boards of health and the Public Health Service. This is an increase of 13 per cent in the number operating under these auspices in 1920. During the year 1921, 90 new clinics have been established as compared with 190 clinics opened in 1920. At the close of the year a total of 624 clinics were in operation, 464 under joint State and Federal control. Of these 624 clinics, Pennsylvania had 111, New York 76, Ohio 30, Illinois 28.

Clinic reports.—In 1920 reports of 383 or 90 per cent of the clinics operating under joint State and Federal control were tabulated. During 1921 the reports of 442 or 91 per cent of the clinics have been tabulated.

The reported admissions in 1921 to clinics under joint auspices were 140,748, an increase of 14,617, or nearly 12 per cent, over the admissions reported in 1920. The number of admissions per clinic reporting showed a decrease, however, having been 329 in 1920 and 318 in 1921. Of the 140,748 patients admitted in 1921, 74,056 had syphilis, 61,059 gonorrhea, and 5,633 chancroid. Again more cases of syphilis than of gonorrhea have been treated in spite of the larger incidence of gonorrhea. Of the patients admitted in 1921 and carried forward from 1920, 55,467 were reported discharged as noninfectious. This is an increase of 21,252 or 62 per cent over 1920, a per clinic increase of 36.

Doses of arsphenamine administered in clinics in 1921 totaled 480,651, an increase per clinic of over 300. The number of Wassermann tests given in 1921 totaled 251,885, and of microscopic examinations for gonococcus infection 185,325.

Following is the tabulated report of the work of the clinics:

Reports of clinics operating under the joint control of the Public Health Service and State board of health, July 1, 1920-June 30, 1921.

State and city.	Total reports received.	Patients admitted.				Patients discharged as non-infectious	Total visits to clinics.	Doses of arsphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
		Total.	Syphilis.	Gonorrhea.	Chan-roid.					
United States.....	4,749	140,748	74,056	61,059	5,633	55,467	2,108,003	480,651	251,885	185,325
Alabama.....	144	10,647	6,019	4,184	444	5,232	82,761	29,373	11,888	4,009
Anniston.....	12	286	71	175	40	345	3,720	282	86	345
Bessemer.....	12	1,185	946	220	19	448	4,450	1,887	1,718	214
Birmingham.....	12	3,881	2,067	1,713	101	1,331	31,678	12,100	5,858	1,167
Eufaula.....	10	194	112	74	8	170	1,824	772	376	180
Florence.....	12	295	114	166	15	172	4,102	659	352	276
Gadsden.....	7	71	34	34	3	41	385	131	45	42
Huntsville.....	12	342	129	198	15	224	3,729	1,021	688	183
Mobile.....	12	1,133	703	355	75	380	9,733	2,478	440	33
Montgomery.....	11	360	170	154	36	148	2,766	676	208	7
Riderwood.....	9	46	10	36	.....	27	259	114	24	4
Talladega.....	11	469	201	231	37	247	4,943	1,228	187	124
Tuscaloosa.....	12	633	511	115	7	303	6,309	2,492	968	782
Cooperative.....	12	1,752	951	713	88	1,396	8,863	5,533	938	652
Arkansas.....	47	2,337	1,281	1,041	15	666	45,207	5,855	3,526	590
Fort Smith.....	12	35	21	12	2	14	562	132	26	14
Helena.....	2	21	11	10	.....	1	96	19	8	8
Hot Springs.....	12	1,732	916	807	9	606	36,354	3,733	2,777	284
Little Rock.....	12	510	306	200	4	26	7,245	1,827	667	266
North Little Rock.....	9	39	27	12	.....	19	450	144	48	18
California.....	81	1,608	1,011	570	27	574	32,313	7,904	7,429	3,305
Los Angeles.....	24	381	285	94	2	44	9,176	1,679	1,412	961
San Bernardino.....	11	87	46	39	2	25	1,962	461	183	138
San Francisco.....	21	1,004	601	383	20	458	17,451	5,200	5,213	1,867
San Jose.....	12	59	38	20	1	32	2,912	353	469	135
Stockton.....	10	77	41	34	2	15	812	211	152	204
Colorado.....	100	1,887	840	894	153	1,083	19,365	4,378	2,444	3,377
Buena Vista.....	12	47	37	10	.....	62	1,218	629	251	9
Colorado Springs.....	12	52	45	7	.....	19	735	310	75	17
Denver.....	24	1,216	650	502	64	610	9,787	2,927	1,809	2,981
Fort Collins.....	12	46	8	33	5	31	668	27	27	62
Leadville.....	12	43	7	33	3	16	722	27	9	81
Pueblo.....	12	422	76	273	73	307	5,837	415	229	105
Salida.....	12	37	6	24	7	25	276	30	32	110
Trinidad.....	4	24	11	12	1	13	122	13	12	12
Connecticut.....	69	1,423	727	664	32	774	23,542	4,206	2,975	2,737
Bridgeport.....	11	323	152	171	.....	90	9,094	1,214	308	182
Hartford.....	12	312	126	170	16	197	3,964	935	239	270
New Haven.....	12	302	230	72	.....	111	7,209	1,269	1,138	185
New London.....	12	76	29	47	.....	61	1,114	202	127	617
Stamford.....	11	290	116	160	14	296	1,688	389	1,102	1,457
Waterbury.....	11	120	74	44	2	19	473	197	61	26
Delaware.....	24	290	147	128	15	64	4,291	753	610	237
Dover.....	12	68	47	18	3	29	378	220	127	20
Wilmington.....	12	222	100	110	12	35	3,913	533	483	217
Florida.....	124	4,214	2,791	1,229	194	1,632	38,045	14,980	6,014	1,696
Ambulatory.....	12	790	556	213	21	666	9,274	3,548	1,456	667
Arcadia.....	11	131	68	35	28	83	1,880	605	191	185
Delray.....	7	29	13	16	.....	4	478	130	43	3
Fort Pierce.....	5	30	22	8	.....	10	108	79	25	3
Jacksonville.....	11	1,708	1,096	545	67	149	12,281	6,946	1,849	132
Key West.....	11	22	11	9	2	5	245	104	27	4
Lake City.....	4	26	22	4	.....	8	74	65	28	5
Miami.....	12	145	49	80	16	91	1,052	165	.....	.....
Pensacola.....	12	427	289	136	2	70	2,420	887	353	130
Sanford.....	10	59	35	18	6	35	585	87	44	10
Tampa.....	12	715	522	146	47	471	8,645	2,050	1,699	469
Wauchula.....	5	25	19	5	1	8	112	45	42	31
West Palm Beach.....	12	107	89	14	4	32	891	269	257	11

Reports of clinics operating under the joint control of the Public Health Service and State board of health, July 1, 1920-June 30, 1921—Continued.

State and city.	Total reports received.	Patients admitted.				Patients discharged as non-infectious.	Total visits to clinics.	Doses of arsenophenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
		Total.	Syphilis.	Gonorrhea.	Chan-croid.					
Georgia.....	80	4,956	2,739	1,928	289	1,419	48,356	14,301	7,396	1,978
Atlanta.....	12	1,127	726	401	.....	.....	.....	3,277	2,060	59
Augusta.....	8	100	52	45	3	7	3,704	420	533	195
Brunswick.....	12	148	136	11	1	36	1,870	919	522	69
Columbus.....	12	394	170	198	26	298	5,391	711	537	882
Macon.....	12	1,333	762	469	102	364	17,643	4,881	1,830	311
Rome.....	12	271	232	38	1	210	1,293	960	242	45
Savannah.....	12	1,583	661	766	156	504	18,455	3,133	1,672	417
Illinois.....	250	6,385	2,729	3,433	223	2,218	93,634	19,218	9,122	7,662
Alton.....	12	195	77	93	25	100	4,254	259	244	206
Cairo.....	12	264	171	87	6	92	3,579	895	614	338
Carlinville.....	12	385	289	88	8	155	1,083	602	552	568
Chicago (9).....	101	4,031	1,372	2,541	118	1,215	57,330	11,337	5,370	3,231
Chicago Heights.....	12	30	16	11	3	11	502	139	27	172
Decatur.....	12	144	106	38	.....	42	4,043	1,311	458	570
East St. Louis.....	11	334	142	168	24	160	4,636	582	530	1,169
Litchfield.....	11	68	29	39	.....	17	1,118	123	90	237
Moline.....	12	203	60	130	13	100	6,505	673	199	174
Peoria.....	10	270	188	73	9	55	1,884	306	283	371
Rockford.....	12	90	40	49	1	51	2,255	504	149	198
Rock Island.....	12	195	112	76	7	195	3,005	1,161	312	319
Springfield.....	11	146	122	22	2	8	2,705	1,199	260	89
West Hammond.....	10	30	5	18	7	17	735	37	34	20
Indiana.....	187	4,749	2,051	2,553	145	2,202	113,602	18,117	9,188	5,483
Anderson.....	12	371	118	251	2	183	6,691	1,033	703	918
Columbus.....	12	45	23	22	.....	14	998	245	74	56
Evansville.....	12	671	268	362	41	348	12,617	2,099	875	234
Fort Wayne.....	12	380	126	248	6	146	8,607	1,378	724	654
Hammond.....	12	232	46	146	40	83	3,994	372	182	73
Indianapolis (2).....	22	1,092	587	406	9	316	46,345	4,132	2,686	1,634
Kokomo.....	12	171	77	93	1	139	3,594	731	314	357
Madison.....	12	64	21	38	5	42	1,499	145	62	20
Marion.....	12	130	32	94	4	46	1,992	107	52	.....
Michigan City.....	12	125	28	89	8	48	1,276	198	134	293
Muncie.....	11	168	88	78	2	88	1,194	599	191	96
New Castle.....	10	38	28	10	.....	18	857	195	300	104
Richmond.....	12	193	104	81	8	58	2,483	712	376	113
South Bend.....	12	370	135	235	.....	193	8,423	1,458	542	671
Terre Haute.....	12	699	370	310	19	480	13,032	4,713	1,973	260
Iowa.....	112	1,811	812	871	128	1,108	28,621	5,153	3,137	2,356
Clinton.....	12	101	35	59	7	76	1,327	314	170	58
Council Bluffs.....	8	30	17	11	2	32	566	151	46	36
Davenport.....	12	249	153	96	.....	20	8,548	1,279	1,029	218
Des Moines.....	12	690	340	350	.....	395	15,976	2,281	1,273	1,555
Dubuque.....	10	42	21	21	.....	20	626	343	85	39
Fort Dodge.....	8	16	5	.....	3	.....	117	108	11	10
Manly.....	9	3	.....	3	.....	4	68	3	9	27
Marshalltown.....	9	7	3	4	.....	11	230	81	66	30
Mason City.....	12	152	70	67	15	143	980	454	233	198
Ottumwa.....	11	23	21	2	.....	16	183	139	28	6
Sioux City.....	9	498	147	250	101	391	.....	.....	187	179
Kansas.....	82	1,633	1,042	583	8	697	24,882	5,092	2,002	2,371
Eldorado.....	11	288	140	148	.....	308	7,307	896	174	841
Florence.....	9	27	5	22	.....	17	725	39	11	63
Junction City.....	8	15	2	13	.....	1	77	1	9	82
Kansas City.....	11	89	62	26	1	10	1,439	346	199	126
Lawrence.....	7	8	6	2	.....	5	302	35	24	35
Rosedale.....	12	668	607	59	2	9	4,518	2,100	1,013	70
Topeka.....	12	166	68	93	5	32	2,200	365	145	366
Wichita.....	12	372	152	220	.....	315	8,314	1,310	427	788

Reports of clinics operating under the joint control of the Public Health Service and State board of health, July 1, 1920-June 30, 1921—Continued.

State and city.	Total reports received.	Patients admitted.				Patients discharged as non-infectious.	Total visits to clinics.	Doses of arsphenamine administered.	Was-sermann tests made.	Microscopic examinations gonococcus.
		Total.	Syphilis.	Gonorrhea.	Chan-croid.					
Kentucky.....	255	4,120	2,293	1,766	61	1,195	54,780	15,469	6,439	8,258
Ashland.....	12	500	278	219	3	112	6,430	2,745	539	1,955
Bowling Green.....	10	46	14	31	1	27	259	52	1	6
Corbin.....	7	28	22	6	.....	14	115	77	55	7
Covington.....	10	94	53	39	2	8	1,956	320	159	126
Dayton.....	11	123	71	52	.....	96	2,848	462	227	195
Frankfort.....	12	277	147	127	3	256	2,417	3,219	2,398	186
Fulton.....	12	105	30	70	5	88	390	105	77	2
Georgetown.....	12	29	20	9	.....	11	246	124	64	17
Greenville.....	10	100	56	44	.....	71	1,406	488	247	152
Harlan.....	9	105	61	44	.....	45	714	304	118	104
Henderson.....	8	82	78	4	.....	3	1,004	412	157	38
Hickman.....	10	23	10	13	.....	6	159	58	12	8
Lexington.....	12	129	117	12	.....	12	921	806	122	3
Louisville.....	12	1,731	884	811	36	97	30,969	3,879	1,389	5,116
Madisonville.....	12	61	44	17	.....	10	697	236	69	39
Mayfield.....	8	101	31	70	.....	91	312	22	12	.....
Maysville.....	12	23	19	4	.....	9	231	104	31	6
Middlesboro.....	9	47	42	5	.....	12	273	129	95	3
Owensboro.....	12	81	63	17	1	30	1,006	528	131	247
Paducah.....	12	111	62	49	.....	25	1,146	269	129	7
Pineville.....	3	77	73	4	.....	.....	309	304	289	.....
Pikeville.....	8	48	22	26	.....	45	270	88	56	.....
Winchester.....	12	123	67	56	.....	74	227	609	11	.....
Hopkinsville.....	8	35	15	13	7	31	146	46	29	37
Irvine.....	5	22	3	19	.....	11	53	10	.....	3
Irvington.....	7	19	11	5	3	11	276	73	22	1
Louisiana.....	51	4,270	2,207	1,730	333	1,848	51,718	10,370	4,086	2,728
Alexandria.....	12	550	187	349	14	188	18,934	1,037	646	2,240
New Orleans (2).....	24	2,758	1,231	1,228	299	1,049	25,850	6,550	2,331	405
Shreveport (2).....	15	962	789	153	20	611	6,934	2,783	1,109	83
Maine.....	85	519	347	171	1	302	6,206	1,645	1,286	587
Augusta.....	6	8	6	2	.....	13	374	85	29	4
Bangor.....	12	108	93	15	.....	61	795	522	194	29
Bath.....	12	56	51	5	.....	.....	1,465	161	319	306
Biddeford.....	6	25	17	8	.....	11	194	76	18	3
Calais.....	11	148	79	69	.....	168	1,058	320	544	12
Eastport.....	8	11	8	3	.....	1	167	54	11	5
Lewiston.....	9	35	26	8	1	21	454	185	73	27
Portland.....	12	116	59	57	.....	20	1,204	137	53	191
Sanford.....	9	12	8	4	.....	7	495	105	45	10
Maryland.....	72	4,326	1,544	2,494	288	706	45,469	8,381	6,262	4,739
Annapolis.....	12	135	35	100	.....	5	1,896	329	168	151
Baltimore (2).....	24	3,799	1,372	2,151	276	483	37,635	7,058	5,646	4,023
Cambridge.....	12	60	33	27	.....	39	1,096	130	70	163
Cumberland.....	12	193	65	123	5	83	2,900	557	184	234
Hagerstown.....	12	139	39	93	7	96	1,942	307	194	168
Massachusetts.....	209	5,908	3,635	2,262	11	1,136	166,618	39,497	14,054	18,324
Attleboro.....	10	33	25	8	.....	35	327	255	58	55
Boston (4).....	48	4,222	2,738	1,479	5	731	138,543	31,581	11,041	16,268
Brookton.....	11	106	71	35	.....	72	1,474	573	175	128
Fall River.....	12	118	53	65	.....	12	4,048	208	163	545
Fitchburg.....	12	61	21	40	.....	24	738	181	101	44
Haverhill.....	8	27	15	12	.....	4	370	99	24	16
Holyoke.....	12	50	27	23	.....	2	305	204	30	6
Lawrence.....	12	140	73	66	1	16	1,714	464	219	5
Lowell.....	12	282	137	142	3	66	4,131	988	523	427
Lynn.....	12	111	44	67	.....	46	3,133	531	284	270
New Bedford.....	12	299	184	115	.....	66	4,226	840	412	99
Pittsfield.....	12	14	4	9	1	13	398	100	42	90
Salem.....	12	114	67	46	1	31	1,324	853	250	166
Springfield.....	12	186	102	84	.....	15	3,163	1,369	260	44
Worcester.....	12	145	74	71	.....	3	2,724	1,251	472	161

Reports of clinics operating under the joint control of the Public Health Service and State board of health, July 1, 1920-June 30, 1921—Continued.

State and city.	Total reports received.	Patients admitted.				Patients discharged as non-infectious.	Total visits to clinics.	Doses of arsphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
		Total.	Syphilis.	Gonorrhea.	Chancroid.					
Michigan.....	134	5,566	2,692	2,839	35	1,333	122,621	13,068	19,084	22,739
Battle Creek.....	11	130	62	64	4	93	2,099	334	139	162
Bay City.....	11	46	13	33	.....	6	604	7	43	285
Detroit.....	12	4,335	2,078	2,257	.....	585	100,408	8,943	14,950	20,298
Escanaba.....	2	41	15	26	.....	27	533	89	21	.....
Flint.....	12	232	112	120	.....	41	4,261	456	1,487	724
Grand Rapids.....	12	157	69	82	6	149	2,360	1,273	196	300
Ishpeming.....	6	16	10	6	.....	9	168	65	16	32
Jackson.....	12	140	84	46	10	135	1,154	753	286	101
Kalamazoo.....	12	117	56	56	5	79	1,757	275	213	257
Lansing.....	12	172	107	63	2	98	5,103	395	1,382	118
Marquette.....	4	10	5	5	.....	.....	82	12	25	32
Muskegon.....	12	87	34	53	.....	95	941	260	125	296
Pontiac.....	2	7	6	1	.....	.....	34	27	25	11
Port Huron.....	4	26	25	1	.....	.....	415	46	45	8
Saginaw.....	10	50	16	26	8	16	2,702	133	131	115
Minnesota.....	58	1,174	567	607	.....	510	32,751	6,575	2,099	1,459
Duluth.....	11	332	120	212	.....	152	8,900	1,282	517	663
Minneapolis (3).....	28	578	320	258	.....	260	17,412	3,769	942	498
St. Paul.....	9	233	108	125	.....	84	6,118	1,385	594	219
South St. Paul.....	3	4	2	2	.....	.....	74	4	23	14
Virginia.....	7	27	17	10	.....	14	247	135	23	65
Mississippi.....	71	4,787	3,025	1,581	181	1,841	35,339	12,762	6,482	3,229
Clarksdale.....	11	616	536	78	2	204	5,598	2,048	1,535	385
Columbus.....	12	405	270	120	15	193	5,618	2,338	830	538
Jackson.....	12	1,168	770	326	72	659	10,313	2,976	2,037	654
Laurel.....	12	1,393	509	828	56	427	2,324	910	.....	428
Meridian.....	12	770	670	88	12	214	7,103	3,240	1,349	177
Vicksburg.....	12	435	270	141	24	144	4,353	1,250	731	1,047
Missouri.....	151	6,344	3,256	3,019	69	1,167	64,367	11,346	11,869	6,842
Hannibal.....	11	68	32	36	.....	61	704	244	50	121
Jefferson City.....	3	10	5	5	.....	1	194	15	15	30
Joplin.....	10	216	144	61	11	240	2,195	975	363	158
Kansas City (5).....	53	1,143	809	279	55	244	9,311	4,201	1,696	1,114
Sedalia.....	11	139	34	104	1	75	1,664	244	129	107
Springfield.....	12	361	164	197	.....	212	5,778	813	412	322
St. Joseph.....	12	367	182	183	2	57	5,035	866	392	365
St. Louis (4).....	39	4,040	1,886	2,154	.....	277	39,486	3,988	8,812	4,625
Montana.....	31	133	92	39	2	114	1,655	890	44	84
Billings.....	11	40	13	26	1	12	298	59	28	60
Butte.....	9	69	65	3	1	87	1,012	778	.....	.....
Great Falls.....	11	24	14	10	.....	15	345	53	16	24
Nebraska.....	103	1,267	517	608	142	564	21,683	4,619	3,157	2,661
Beatrice.....	10	9	.....	9	.....	10	93	.....	10	39
Fremont.....	12	45	11	30	4	38	509	77	62	41
Grand Island.....	12	19	4	14	1	17	284	66	47	84
Hastings.....	12	51	17	34	.....	30	1,621	156	59	277
Lincoln.....	12	251	69	173	9	64	7,567	1,436	968	922
North Platte.....	10	19	17	2	.....	22	218	178	94	19
Omaha (2).....	23	840	388	332	120	367	10,636	2,390	1,870	1,219
Winnebago.....	12	33	11	14	8	16	755	316	47	60
New Hampshire.....	42	276	135	140	1	57	9,295	1,969	800	371
Concord.....	6	27	16	11	.....	6	256	173	58	12
Dover.....	12	26	19	6	1	17	637	153	49	37
Manchester.....	12	149	65	84	.....	19	7,002	999	510	234
Nashua.....	12	74	35	39	.....	15	1,400	644	183	88

Reports of clinics operating under the joint control of the Public Health Service and State board of health, July 1, 1920-June 30, 1921—Continued.

State and city.	Total reports received.	Patients admitted.				Patients discharged as non-infections.	Total visits to clinics.	Doses of arsphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
		Total.	Syphilis.	Gonorrhea.	Chan-roid.					
New Jersey.....	138	2,840	1,394	1,433	13	434	42,222	8,981	7,112	2,154
Atlantic City.....	7	183	104	77	2	6	2,176	993	390	166
Bayonne.....	10	17	13	4	.....	4	138	81	23	1
Camden.....	12	469	224	245	.....	50	5,638	1,013	799	93
Elizabeth.....	9	48	37	10	1	5	738	204	82	35
Jersey City.....	10	259	141	115	3	44	5,384	634	1,405	80
Long Branch.....	12	71	58	13	.....	22	2,049	434	241	8
Montclair.....	7	19	14	4	1	1	298	188	80	1
Newark.....	10	1,165	394	771	.....	183	12,703	981	2,693	1,421
New Brunswick.....	11	35	18	16	1	39	858	205	61	35
Orange.....	12	115	89	23	3	9	2,273	1,320	406	28
Passaic.....	7	17	16	1	.....	1	407	125	43	4
Patterson (2).....	10	146	101	45	.....	12	2,560	817	184	31
Plainfield.....	9	88	67	21	.....	13	1,932	571	175	53
Trenton.....	12	208	118	88	2	45	5,068	1,415	530	198
New Mexico.....	14	87	32	55	.....	7	345	108	43	68
Albuquerque.....	3	33	7	26	.....	.....	19	12	6	2
Roswell.....	2	7	7	.....	.....	4	75	29	15	17
Santa Fe.....	9	47	18	29	.....	3	251	67	22	49
New York.....	453	7,994	4,277	3,469	248	3,835	141,336	38,352	12,411	6,189
Albany (2).....	24	114	57	52	5	81	2,019	605	174	125
Amsterdam.....	12	30	12	18	.....	48	1,462	1,500	51	45
Binghamton.....	12	132	87	45	.....	106	4,493	1,765	329	87
Buffalo (3).....	31	1,726	917	760	49	767	33,559	5,846	2,405	1,990
Corning.....	11	51	41	10	.....	13	465	379	17	3
Dunkirk.....	12	18	12	6	.....	13	547	71	41	214
Elmira.....	12	159	88	71	.....	83	2,848	754	213	83
Glens Falls.....	12	52	31	21	.....	32	1,883	385	81	28
Gloversville.....	12	23	16	7	.....	32	1,033	295	40	30
Hornell.....	12	45	27	18	.....	58	785	470	72	26
Ithaca.....	12	131	47	84	.....	177	2,713	558	115	599
Jamestown.....	10	58	34	24	.....	3	846	311	116	54
Kingston.....	12	20	13	7	.....	12	130	54	28	21
Little Falls.....	11	14	13	1	.....	25	165	123	44	21
Middletown.....	11	35	35	.....	.....	19	1,172	378	45	2
New Rochelle.....	11	70	39	31	.....	26	910	204	113	97
New York City.....	12	3,033	1,517	1,334	182	1,168	47,528	14,184	4,218	1,152
Niagara Falls.....	12	129	70	53	6	131	2,016	709	288	251
North Tonawanda.....	12	25	18	7	.....	7	514	331	53	11
Olean.....	5	21	19	2	.....	4	125	49	15	2
Oswego.....	12	29	20	8	1	37	844	367	60	12
Plattsburg.....	8	6	3	3	.....	1	75	23	8	6
Port Chester.....	12	48	29	19	.....	10	730	272	99	48
Poughkeepsie.....	12	81	60	21	.....	53	1,437	381	269	94
Rochester (5).....	60	658	483	175	.....	123	11,452	4,055	1,547	249
Rome.....	12	91	52	39	.....	50	1,524	496	179	43
Schenectady.....	11	93	38	55	.....	60	1,157	256	114	71
Syracuse.....	22	603	238	365	.....	277	7,559	1,132	887	437
Troy.....	12	84	46	38	.....	32	1,365	424	95	58
Utica.....	12	254	121	133	.....	322	5,001	1,044	419	174
White Plains.....	10	18	14	4	.....	2	250	79	38	3
Yonkers.....	12	143	80	58	5	63	5,229	852	229	153
North Carolina.....	64	1,583	953	539	91	514	20,416	6,475	2,593	1,328
Asheville.....	12	221	122	77	22	117	1,826	532	266	62
Charlotte.....	11	661	469	180	12	65	13,917	4,429	1,828	843
Clinton.....	11	64	18	39	7	48	273	63	27	86
Fayetteville.....	12	210	139	61	10	68	1,814	698	192	183
Greensboro.....	6	76	44	29	3	39	684	149	80	.....
Winston-Salem.....	12	351	161	153	37	177	1,902	604	200	154
North Dakota.....	36	147	67	79	1	103	1,624	511	423	486
Fargo.....	12	80	37	43	.....	52	764	230	235	216
Grand Forks.....	12	31	20	11	.....	34	402	187	136	83
Minot.....	12	36	10	25	1	17	458	94	52	187

Reports of clinics operating under the joint control of the Public Health Service and State board of health, July 1, 1920-June 30, 1921—Continued.

State and city.	Total reports received.	Patients admitted.				Patient discharged as non-infectious.	Total visits to clinics.	Doses of arsenophene administered.	Wassermann tests made.	Microscopic examinations gonococcus.
		Total.	Syphilis.	Gonorrhea.	Chan-croid.					
Ohio.....	275	9,054	4,833	3,914	307	3,164	127,522	37,146	15,438	9,219
Akron.....	11	1,367	623	661	83	1,245	23,505	3,667	2,742	3,265
Alliance.....	11	161	43	111	7	59	2,508	678	291	66
Canton.....	10	109	92	17	.....	11	1,237	441	190	7
Chillicothe.....	12	32	19	13	.....	7	267	70	20	66
Cincinnati (2).....	23	1,458	1,012	412	34	102	17,064	6,553	2,188	357
Cleveland (5).....	55	2,486	1,478	991	17	353	35,036	9,156	4,175	850
Columbus (2).....	22	434	297	137	.....	104	5,740	1,369	1,480	819
Dayton (2).....	23	444	209	231	4	149	6,912	1,447	752	561
Hamilton.....	12	154	68	85	.....	29	1,641	487	133	91
Ironton.....	12	110	88	19	3	59	1,309	421	219	51
Lima.....	12	185	94	91	.....	67	5,097	1,248	286	329
Springfield (2).....	23	241	97	137	7	143	2,129	450	280	428
Toledo.....	12	1,257	429	711	117	597	15,982	9,182	1,896	1,849
Warren.....	4	16	9	7	.....	794	151	21	.....	4
Youngstown (2).....	21	323	165	156	2	66	4,407	1,118	503	431
Portsmouth.....	12	277	110	135	32	173	3,894	708	262	45
Oklahoma.....	84	3,117	1,672	1,280	165	2,346	54,405	16,534	3,957	3,591
Bartlesville.....	12	396	214	182	.....	297	6,336	1,446	688	386
Chicasha.....	12	164	84	65	15	213	5,065	759	345	204
McAlester.....	5	38	23	12	3	8	226	85	83	20
Muskogee.....	12	134	75	36	23	79	1,367	608	134	49
Oklahoma City.....	12	1,268	609	570	89	1,021	25,090	3,756	1,238	1,491
Picher.....	8	371	216	120	35	352	1,398	675	60	72
Shawnee.....	12	120	50	70	.....	46	1,930	571	116	132
Tulsa.....	11	626	401	225	.....	330	12,993	8,634	1,293	1,237
Oregon.....	10	339	128	211	.....	77	3,030	556	514	479
Portland.....	10	339	128	211	.....	77	3,030	556	514	479
Pennsylvania.....	337	6,570	3,962	2,595	13	1,851	94,295	31,469	14,836	3,542
Allentown.....	12	337	222	115	.....	82	5,481	2,412	1,332	123
Altoona.....	12	158	71	87	.....	100	2,763	433	103	36
Bethlehem.....	12	112	94	18	.....	83	1,730	1,275	331	34
Butler.....	12	72	35	32	5	43	869	215	118	10
Chambersburg.....	5	13	6	6	1	5	211	29	14	9
Chester.....	12	196	103	89	4	55	2,222	572	249	94
Clearfield.....	12	124	92	32	.....	41	1,331	883	450	90
Coatesville.....	12	108	75	33	.....	13	1,383	389	292	39
Easton.....	12	143	52	91	.....	60	2,810	620	495	120
Erie.....	12	269	190	79	.....	102	2,500	866	323	42
Greensburg.....	11	199	167	32	.....	15	2,551	845	1,223	252
Harrisburg.....	11	216	153	63	.....	19	4,131	926	250	128
Hazleton.....	11	68	39	29	.....	26	910	367	118	63
Johnstown.....	12	144	78	66	.....	74	1,381	385	202	60
Lancaster (2).....	24	185	156	29	.....	29	2,337	766	493	73
Lebanon.....	12	119	75	44	.....	71	1,827	522	253	124
New Castle.....	12	125	97	28	.....	32	1,832	465	274	38
Philadelphia (2).....	16	696	356	340	.....	88	10,771	3,619	2,344	1,014
Pittsburgh.....	12	1,614	993	621	.....	154	14,964	4,409	1,828	120
Pottsville.....	12	49	37	12	.....	20	963	537	172	44
Reading.....	11	249	131	118	.....	303	4,297	1,423	712	296
Scranton.....	12	364	204	160	.....	145	6,896	2,367	911	347
Shamokin.....	12	128	72	56	.....	59	2,243	778	218	2
Stroudsburg.....	9	30	8	22	.....	11	144	48	44	35
Sunbury.....	12	142	86	56	.....	37	2,825	705	289	140
Washington.....	12	118	61	54	3	55	1,935	245	189	41
Wilkes-Barre.....	12	471	220	251	.....	88	11,001	4,043	1,310	117
Williamsport.....	11	121	89	32	.....	41	1,987	1,330	299	51
Rhode Island.....	76	832	510	322	.....	154	19,360	8,262	5,016	1,825
Arctic.....	7	5	4	1	.....	3	68	56	18	2
Newport.....	12	17	16	1	.....	11	215	164	22	1
Pawtucket.....	12	79	34	45	.....	47	2,058	430	127	114
Providence (3).....	36	721	447	274	.....	89	16,930	7,565	4,835	1,707
Woonsocket.....	9	10	9	1	.....	4	89	47	14	1

Reports of clinics operating under the joint control of the Public Health Service and State board of health, July 1, 1920-June 30, 1921—Continued.

State and city.	Total reports received.	Patients admitted.				Patients discharged as non-infectious.	Total visits to clinics.	Doses of arsenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
		Total.	Syphilis.	Gonorrhea.	Chancroid.					
South Carolina.....	107	8,279	3,945	3,733	601	2,470	122,419	25,422	10,755	10,237
Anderson.....	12	1,040	345	498	197	687	11,787	1,599	1,078	1,784
Charleston.....	12	1,249	645	475	129	250	6,656	1,171	927	462
Columbia.....	12	1,124	595	458	71	151	13,286	3,104	1,877	750
Florence.....	12	769	449	293	27	139	14,093	5,594	853	401
Greenville.....	12	1,201	489	634	78	259	27,860	3,172	1,559	1,319
Newberry.....	12	354	192	162	.....	247	5,016	1,412	755	414
Orangeburg.....	12	757	440	282	35	390	18,437	4,552	2,548	68
Spartanburg.....	12	1,426	587	796	43	242	22,078	4,000	690	4,995
Union.....	11	359	203	135	21	105	3,206	818	468	35
South Dakota.....	32	110	64	44	2	50	1,361	179	200	379
Aberdeen.....	12	39	25	13	1	15	350	62	80	47
Lead.....	9	7	2	5	.....	6	67	8	6	43
Sioux Falls.....	11	64	37	26	1	29	944	109	114	289
Tennessee.....	53	3,363	1,994	1,157	212	1,404	74,887	9,471	10,075	7,784
Chattanooga.....	12	1,045	525	487	33	464	27,594	2,906	1,000	3,090
Johnson City.....	3	28	10	15	3	5	256	36	12	.....
Knoxville.....	7	415	261	110	44	30	3,785	786	495	292
Memphis.....	11	1,025	816	163	46	567	19,543	2,652	6,511	794
Nashville (2).....	20	850	382	382	86	338	23,709	3,091	2,057	3,608
Texas.....	106	8,062	3,626	3,456	980	7,094	133,160	15,645	9,663	12,501
Beaumont.....	6	128	73	42	13	73	1,568	280	116	.....
Dallas (2).....	16	1,464	743	669	52	421	20,958	3,097	1,866	1,613
El Paso.....	12	649	304	312	33	292	24,443	1,282	1,029	1,476
Fort Worth.....	12	500	223	277	.....	62	8,219	877	459	599
Galveston.....	12	955	475	296	184	703	5,269	2,132	678	574
Houston.....	12	3,231	1,253	1,338	640	5,010	62,586	5,399	4,180	6,161
Port Arthur.....	12	216	59	126	31	133	2,528	346	126	547
San Antonio.....	12	759	410	323	26	381	6,942	1,664	994	1,439
Waco.....	12	160	86	73	1	19	647	568	215	92
Utah.....	24	257	103	146	8	157	5,417	734	327	566
Ogden.....	12	87	11	71	5	36	2,555	14	17	413
Salt Lake City.....	12	170	92	75	3	121	2,862	720	310	153
Vermont.....	32	126	84	42	.....	70	1,607	522	319	533
Barre.....	11	9	8	1	.....	.....	138	54	22	.....
Burlington.....	12	85	48	37	.....	56	1,165	310	196	495
Rutland.....	9	32	28	4	.....	14	304	153	101	38
Virginia.....	106	4,693	2,617	1,911	165	2,190	50,832	14,373	7,820	5,081
Alexandria.....	12	205	72	115	18	174	2,666	685	461	405
Danville.....	12	200	81	107	12	97	1,272	132	219	286
Lynchburg.....	12	307	81	198	28	60	3,842	618	388	676
Newport News.....	10	685	530	147	8	318	6,006	3,053	1,292	532
Norfolk.....	12	777	403	314	60	655	7,648	2,199	1,243	1,136
Norton.....	12	680	348	330	2	351	8,190	1,932	343	92
Petersburg.....	12	377	190	183	4	106	4,735	964	427	781
Richmond.....	12	1,118	791	319	8	277	12,273	4,311	3,204	840
Roanoke.....	12	344	121	198	25	152	4,200	479	243	333
Washington.....	43	1,045	449	592	4	481	22,750	3,949	4,521	8,361
Everett.....	8	28	7	21	.....	11	731	63	19	28
Seattle.....	12	357	186	170	1	25	1,740	2,191	3,116	705
Spokane.....	12	483	163	320	.....	391	18,474	1,444	1,004	7,064
Tacoma.....	11	177	93	81	3	54	1,805	251	382	564
West Virginia.....	36	539	395	135	9	344	5,289	2,367	763	336
Charleston.....	12	230	164	59	7	212	2,105	1,009	206	69
Huntington.....	12	70	52	16	2	76	456	300	276	148
Wheeling.....	12	239	179	60	.....	56	2,698	1,058	281	119

Report of clinics operating under the joint control of the Public Health Service and State board of health, July 1, 1920-June 30, 1921—Continued.

State and city.	Total reports received.	Patients admitted.				Patients discharged as non-infectious.	Total visits to clinics.	Doses of arsphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
		Total.	Syphilis.	Gonorrhea.	Chancroid.					
Wisconsin.....	150	1,004	419	568	17	255	18,020	3,602	3,536	2,655
Beloit.....	10	56	14	40	2	30	650	107	40	76
Green Bay.....	12	29	16	13	.....	14	340	50	60	38
Janesville.....	12	32	11	21	.....	8	836	131	74	85
Kenosha.....	12	13	6	7	.....	9	194	55	52	74
La Crosse.....	12	45	17	28	.....	11	960	75	132	213
Madison.....	12	61	19	42	.....	5	731	163	110	155
Milwaukee (3).....	34	561	262	284	15	138	11,512	2,804	2,694	1,367
Oshkosh.....	12	26	9	17	.....	9	372	37	66	110
Racine.....	10	47	21	26	.....	14	263	31	80	103
Superior.....	12	96	38	58	.....	5	1,950	133	184	380
Wausau.....	12	38	6	32	.....	12	212	16	44	54
Wyoming.....	11	77	33	44	.....	25	585	72	170	189
Casper.....	11	77	33	44	.....	25	585	72	170	189

The table just given includes the number of monthly reports received from each clinic. This makes it possible to estimate fairly accurately the monthly and daily admissions per clinic in the various States. For the United States the monthly admissions averaged 29.6. On the basis of a 30-day month this gives a daily average of 0.9. Following is a table showing the States ranked according to the average monthly and daily admissions:

Table showing States ranked according to the average monthly and daily admissions per clinic, July 1, 1920-June 30, 1921.

Rank.	State.	Average monthly admissions per clinic.	Average daily admissions per clinic.	Rank.	State.	Average monthly admissions per clinic.	Average daily admissions per clinic.
	United States.....	29.6	0.9	23	Connecticut.....	20.5	0.7
1	Louisiana.....	83.7	2.8	24	Minnesota.....	20.2	.7
2	South Carolina.....	77.4	2.6	25	California.....	19.9	.7
3	Texas.....	76.1	2.5	26	Kansas.....	19.9	.7
4	Alabama.....	73.9	2.5	27	Pennsylvania.....	19.5	.6
5	Mississippi.....	67.3	2.2	28	Colorado.....	18.9	.6
6	Tennessee.....	63.5	2.1	29	New York.....	17.6	.6
7	Georgia.....	61.9	2.1	30	Iowa.....	16.2	.5
8	Maryland.....	60.1	2.0	31	Kentucky.....	16.2	.5
9	Arkansas.....	49.7	1.7	32	West Virginia.....	14.9	.5
10	Virginia.....	44.3	1.5	33	Nebraska.....	12.3	.4
11	Michigan.....	42.4	1.4	34	Delaware.....	12.1	.4
12	Missouri.....	42.0	1.4	35	Rhode Island.....	10.9	.4
13	Oklahoma.....	37.1	1.2	36	Utah.....	10.8	.4
14	Florida.....	33.9	1.1	37	Wyoming.....	7.0	.2
15	Oregon.....	33.9	1.1	38	Wisconsin.....	6.7	.2
16	Ohio.....	32.9	1.1	39	New Hampshire.....	6.6	.2
17	Massachusetts.....	28.3	.9	40	New Mexico.....	6.2	.2
18	Illinois.....	25.5	.8	41	Maine.....	6.1	.2
19	Indiana.....	25.4	.8	42	Montana.....	4.3	.1
20	North Carolina.....	24.7	.8	43	North Dakota.....	4.1	.1
21	Washington.....	24.3	.8	44	Vermont.....	3.9	.1
22	New Jersey.....	20.6	.7	45	South Dakota.....	3.4	.1

In studying the table above care should be taken not to confuse admissions with attendance. A person who has been admitted as a patient may visit the clinic many times for examination, treatment, and consultation, but in the averages given he is counted only once.

In the clinic survey made in 1920 importance was attached to the use of the dark field for the detection of the treponema pallidum in the early stages of syphilis. In entering the reports from the clinics in 1921 a record was kept of the number of examinations made with the dark field. Only 7,559 of these examinations were reported by a comparatively small number of clinics. It is believed that the States should place greater emphasis upon the importance of including the dark-field examination in cases of primary syphilis.

Reports of other institutions.—In addition to the 442 clinics under joint State and Federal control, whose reports have been under discussion, the division has received monthly reports from 58 institutions where venereal diseases are treated which may be classified as follows:

General hospitals and dispensaries	29
State hospitals for the insane	6
Correctional and penal institutions	23
Total	58

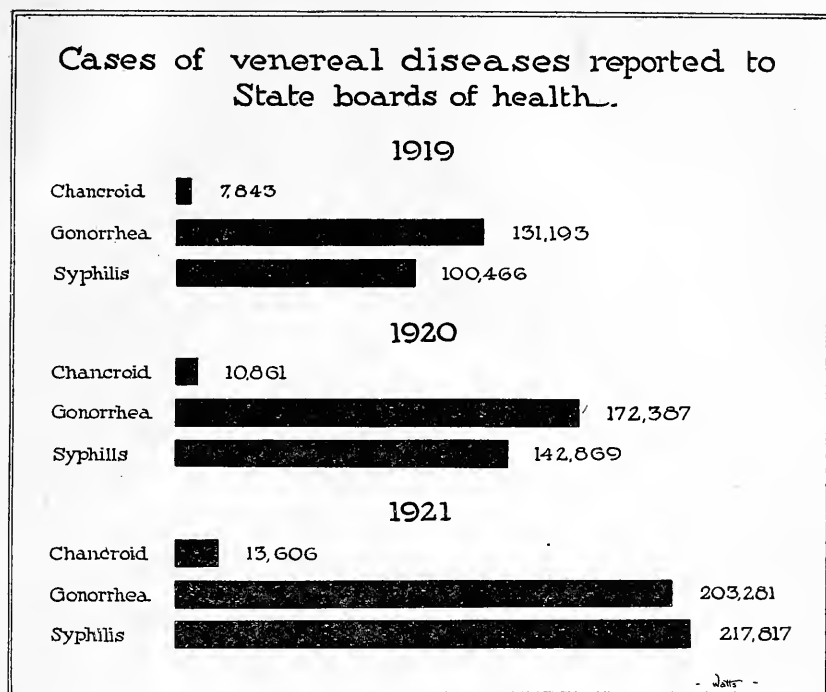
The reports of these institutions may be tabulated as follows:

Patients admitted:	
Syphilis	3, 973
Gonorrhea	3, 861
Chancroid	442
Total	8, 276
Patients discharged as noninfectious	6, 504
Doses of arsphenamine administered	27, 925
Wassermann tests made	21, 464
Microscopic examinations made for treponema pallidum	591
Microscopic examinations made for gonococcus infection	15, 264

REPORTING OF VENEREAL DISEASES.

In the spring of 1921 Nevada, the forty-eighth State, adopted the regulations requiring the reporting of venereal diseases. The District of Columbia is now the only section of the country not protected by such requirements. Reports of cases received from the State boards of health show an increase of 33 per cent in 1921. Of the total 434,704 cases reported, 217,817 were syphilis, 203,281 gonorrhea, and 13,606 chancroid. Reports of syphilis exceed those of gonorrhea by 14,536 cases. Cases of syphilis reported in 1921 have increased in number 52 per cent, while those of gonorrhea have increased only 18 per cent. Of the 217,817 cases of syphilis, 34 per cent were reported by the clinics. Of the 203,281 cases of gonorrhea, 30 per cent were reported by the clinics. In other words, 66 per cent of the total cases of syphilis and 70 per cent of the cases of gonorrhea were reported by private physicians, hospitals, health officers, laboratories, and other agencies.

The following graph shows the relative increase in the cases reported by State boards of health during the last three years:



From the following table, giving the number of cases reported by each State board of health, it will be noticed that both New York and Pennsylvania reported syphilis greatly in excess of gonorrhea, which largely accounts for a similar excess in the totals for the country. The excess is probably not due to a greater incidence of syphilis, but to the method of reporting cases through the laboratories in these States:

Cases of venereal diseases reported to State boards of health July 1, 1920–June 30, 1921.

State.	Total.	Syphilis.	Gonorrhea.	Chancroid.
United States.....	434,704	217,817	203,281	13,606
Alabama.....	15,519	8,178	6,587	754
Arizona.....	324	84	229	11
Arkansas.....	8,887	4,116	4,432	339
California.....	8,993	4,578	4,415	.....
Colorado.....	3,416	1,228	1,963	225
Connecticut.....	3,624	2,343	1,281	.....
Delaware.....	684	186	426	72
District of Columbia ¹.....	.....	.....	.....	.....
Florida.....	5,689	3,297	2,133	259
Georgia.....	8,998	3,598	4,941	459
Idaho.....	290	136	153	1
Illinois.....	28,631	9,823	17,828	980
Indiana.....	5,457	2,540	2,801	116
Iowa.....	4,026	1,254	2,643	129
Kansas.....	3,372	1,519	1,828	25
Kentucky.....	24,651	14,947	9,467	237

¹ Venereal diseases not reported.

*Cases of venereal diseases reported to State boards of health July 1, 1920—
June 30, 1921—Continued.*

State.	Total.	Syphilis.	Gonorrhea.	Chanroid.
Louisiana.....	10,330	4,106	5,000	1,224
Maine.....	1,726	545	1,161	20
Maryland.....	4,674	2,014	2,419	241
Massachusetts.....	9,572	2,781	6,791	.....
Michigan.....	19,286	7,799	11,277	210
Minnesota.....	9,605	4,132	5,248	225
Mississippi.....	7,930	4,615	2,949	366
Missouri.....	10,251	4,245	5,431	575
Montana.....	1,465	534	928	3
Nebraska.....	6,739	2,139	4,205	395
Nevada.....	.....	.....	.....	.....
New Hampshire.....	933	320	597	16
New Jersey.....	6,848	3,616	3,100	132
New York.....	34,626	26,819	7,801	6
New Mexico.....	577	159	394	24
North Carolina.....	7,342	2,505	4,499	338
North Dakota.....	1,131	291	831	9
Ohio.....	11,128	5,931	4,768	429
Oklahoma.....	6,659	3,123	3,146	390
Oregon.....	1,452	291	1,131	30
Pennsylvania.....	54,633	38,200	16,040	393
Rhode Island.....	7,493	5,506	1,979	8
South Carolina.....	12,159	5,967	5,467	725
South Dakota.....	788	208	559	21
Tennessee.....	6,143	2,885	2,945	313
Texas.....	50,685	22,006	25,653	3,026
Utah.....	1,026	248	761	17
Vermont.....	764	373	391	.....
Virginia.....	6,657	3,139	3,244	274
Washington.....	4,228	897	3,179	152
West Virginia.....	10,262	3,594	6,318	350
Wisconsin.....	3,468	511	2,903	54
Wyoming.....	1,563	491	1,039	33

¹ Venereal diseases not reported.

A comparison of the reports of cases from the individual States in 1919 and 1920 showed a decrease in the number of reports received in only 8 States. A similar comparison of reports received in 1920 and 1921 shows a decrease in the number of cases reported in 1921 in 27 States. In fact, if it were not for the reports from Pennsylvania, which State reported cases last three months only in 1920, and for the large increase in the number of cases reported by Kentucky and Texas, the totals for 1921 would probably have fallen below those of 1920. This decrease in the number of cases reported cannot be proved to be due to a corresponding decrease in the number of infections. It is likely due to many factors difficult to evaluate and discuss with accuracy.

The following table shows the States ranked according to the percentage of increase or decrease in the number of cases reported in 1921 as compared with 1920. Pennsylvania is omitted for the reason that reports were received three months only in 1920, which would render such a comparison unfair:

Tables showing States ranked according to the percentage of increase or decrease in the number of cases of venereal diseases reported for the year 1921.

STATES SHOWING INCREASE.

Rank.	State.	Per cent of increase.	Rank.	State.	Per cent of increase.
1	Rhode Island.....	512.58	11	Virginia.....	18.43
2	Kentucky.....	491.86	12	Louisiana.....	15.47
3	Texas.....	232.05	13	Florida.....	13.55
4	Mississippi.....	138.64	14	Nebraska.....	12.34
5	Arkansas.....	86.35	15	Oregon.....	8.84
6	Missouri.....	69.42	16	South Carolina.....	2.81
7	West Virginia.....	64.30	17	Connecticut.....	1.35
8	Wyoming.....	32.12	18	Washington.....	0.93
9	Maryland.....	25.85	19	Minnesota.....	0.78
10	New Mexico.....	24.09			

STATES SHOWING DECREASE.

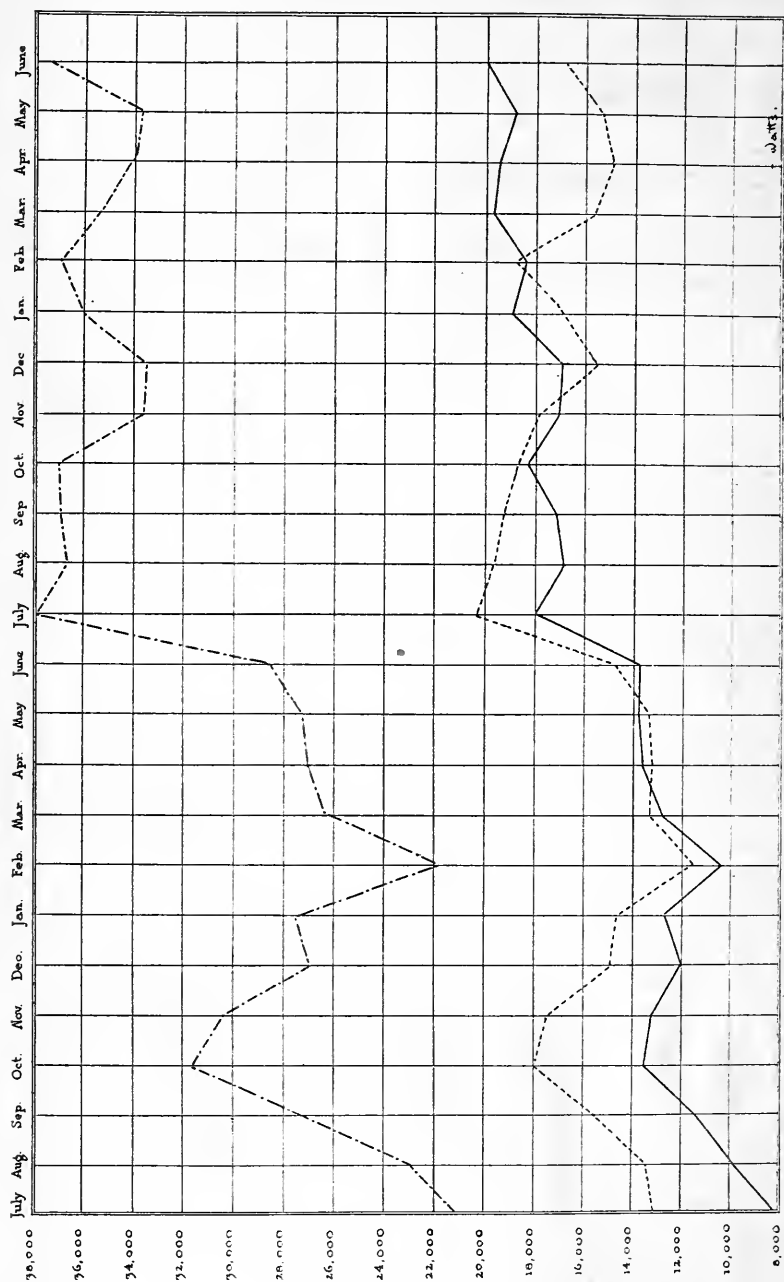
Rank.	State.	Per cent of decrease.	Rank.	State.	Per cent of decrease.
20	California.....	1.19	34	Ohio.....	19.05
21	Michigan.....	1.76	35	Maine.....	20.90
22	New York.....	3.14	36	Vermont.....	21.24
23	Iowa.....	3.38	37	Massachusetts.....	22.26
24	New Jersey.....	4.71	38	New Hampshire.....	23.02
25	Kansas.....	4.72	39	Arizona.....	23.40
26	Illinois.....	10.17	40	Georgia.....	24.41
27	North Dakota.....	10.52	41	Delaware.....	26.00
28	Tennessee.....	10.88	42	Colorado.....	27.36
29	Alabama.....	13.06	43	Montana.....	36.16
30	Oklahoma.....	13.12	44	South Dakota.....	37.00
31	Wisconsin.....	14.94	45	Indiana.....	44.82
32	North Carolina.....	15.09	46	Utah.....	46.75
33	Idaho.....	18.99			

The monthly variation in the number of cases reported has been less marked in 1921 than it was in 1920. The highest point reached in the past fiscal year was in July, 1920, with a total of 38,000. The graph on page 370 shows the monthly variation in the cases of gonorrhea and syphilis reported and of the combined total of these diseases for the last two years:

DISTRIBUTION OF ARSPHENAMINE.

The State boards of health report the distribution of 532,778 doses of arsphenamine for the past year, an increase of 204,396, or 62 per cent, over 1920. Nearly 90 per cent of the total amount distributed was reported as administered by the clinics showing that only a small amount is being furnished hospitals or physicians in private practice.

The graph and table on page 371 show the relative increase in the amounts distributed during the past three years and the total reported by the States in 1921.



— Syphilis. — Gonorrhea. — Total syphilis and gonorrhea.
 Cases of venereal diseases reported to State boards of health by months for the years July 1, 1919—June 30, 1921.

Doses of arsphenamine administered through State boards of health.

1919 [REDACTED] 118,055

1920 [REDACTED] 328,382

1921 [REDACTED] 532,778

*State report of doses of arsphenamine (or similar product) distributed
July 1, 1920-June 30, 1921.*

State.	Doses distributed.	State.	Doses distributed.
United States.....	532,778	Montana.....	926
Alabama.....	29,718	Nebraska.....	5,201
Arizona.....	168	Nevada ¹.....	.....
Arkansas.....	6,417	New Hampshire.....	1,985
California.....	14,200	New Jersey.....	8,898
Colorado.....	4,404	New York.....	40,125
Connecticut.....	5,107	New Mexico.....	108
Delaware.....	737	North Carolina.....	6,485
District of Columbia ¹.....	.....	North Dakota.....	511
Florida.....	16,264	Ohio.....	34,230
Georgia.....	24,209	Oklahoma.....	17,886
Idaho ¹.....	.....	Oregon.....	992
Illinois.....	25,220	Pennsylvania.....	33,586
Indiana.....	19,536	Rhode Island.....	8,447
Iowa.....	7,422	South Carolina.....	25,956
Kansas.....	7,887	South Dakota.....	205
Kentucky.....	17,545	Tennessee.....	11,170
Louisiana.....	12,427	Texas.....	15,995
Maine.....	1,541	Utah.....	908
Maryland.....	8,857	Vermont.....	555
Massachusetts.....	38,680	Virginia.....	13,725
Michigan.....	14,934	Washington.....	5,252
Minnesota.....	7,674	West Virginia.....	2,520
Mississippi.....	13,131	Wisconsin.....	4,418
Missouri.....	16,519	Wyoming.....	99

¹ No report received.

As a result of the regulations approved by the Secretary of the Treasury providing for the control of the manufacture and sale of arsphenamine, inspections have been made of several plants with the result that 8 firms have been licensed by the service to manufacture and sell arsphenamine products.

REQUESTS FOR MEDICAL INFORMATION.

The division has handled 2,605 requests for medical information in 1921, as compared with 3,161 in 1920. Of those asking for information, 1,816, or nearly 70 per cent, complained of suffering from a venereal disease, and it is probable that some of the others may

have had gonorrhea or syphilis. Following is a classification of these requests according to the nature of the complaint:

Venereal diseases.....	693
Syphilis.....	409
Gonorrhea.....	664
Gleet.....	40
Chancroid.....	10
Lost manhood.....	267
Seminal emissions.....	70
Masturbation.....	87
Venereal disease literature and addresses of clinics.....	66
Hydrocele and varicocele.....	41
General.....	258
Total.....	2,605

The chief source of information about the service given by those writing for advice has been the "Health column" issued by the section of public health education, to which reference was made in 413 inquiries. Train and lavatory placards were given as a source of information in 252 cases. A classification of the sources given follows:

Train and lavatory placards.....	252
War Risk Insurance.....	1
Health column.....	413
American Legion Weekly.....	42
Advertisements.....	84
Films.....	25
Journal of Industrial Hygiene.....	1
Physical Culture Magazine.....	3
Machinists Monthly Journal.....	1
A friend.....	5
A physician.....	1
Street car.....	1
Venereal disease literature.....	50
Not stated.....	1,726
Total.....	2,605

SPECIAL FEATURES.

The seamen's service center.—From the point of view of medical social service, one of the most important achievements of the service during the past year and a half has been the work of the seamen's service center in New York city.

The center was opened in February, 1920, under the direction of the Public Health Service in cooperation with the American Red Cross. The work was continued through June, 1921, when the Red Cross withdrew from the management and the work was transferred to the Marine Hospital Division of the service with headquarters in the barge office.

The work of the center was unique, and aside from the actual service rendered was valuable in showing the need for permanent medical and social service stations for seamen of all countries who enter the ports of the United States.

From the time of its opening through February 28, 1921, 11,611 seamen applied at the center for help. Of these 10,230 cases were recorded because of the service given them. Medical examinations were given to 4,336 able-bodied seamen, of whom 204 failed to pass because of color blindness, defective vision, acute venereal infection, hernias, and other disabilities. Intensive service was required by

5,894. This service included 3,149 medical examinations, finding employment for 2,370, securing material relief for 593, and giving or securing legal aid and advice for 841. Diagnoses for venereal disease were provisional only, including cases which could be detected without laboratory examination. Nevertheless, 1,283 cases of actively infectious venereal diseases were found among those examined. Of these 492 were syphilis, 656 were gonorrhea, and 135 chancroid. Following the policy of the center, these cases were referred to the clinics or hospitals for further examination and treatment.

As reported in 1920, one of the purposes of the center was "to act as a clearing house through which sick, disabled, and needy sailors of the merchant fleets of the world may be distributed to cooperating social agencies or individuals for detailed help, and, when necessary, sent to institutions, hospitals, or dispensaries for proper care and treatment." In order to do this the center made a careful survey of all hospitals, clinics, missions, unions, and miscellaneous social agencies to determine the amount and character of service which could be utilized. A survey was also made of steamship companies, of regular boarding houses, and of the governmental and extragovernmental agencies, including the consuls of other countries. In order better to coordinate the work of the various social agencies assisting in the relief of seamen ashore, the Surgeon General suggested that the social service exchange call a conference of representatives of these agencies. This was done and the conference held in the Charities Building, New York City, February 25, 1921. Representatives from about 75 different agencies were present. A discussion of the work which each organization was doing took place. Several general meetings and special conferences have since been held and a permanent council with a definite program has been organized.

As a result of the intensive study of cases carried on by the center the following unsupplied needs of seamen are apparent:

1. Hospital accommodations for slight or incipient illnesses so that curative and preventive treatment may prevent serious illness later.

2. Care for convalescents, including proper diet, rest, and a healthful environment which will prevent relapses or serious complications due to improper care.

3. Periodical examinations to detect the presence of venereal diseases; also, as a preventive of infection, adequate instruction in sex hygiene.

4. More hygienic conditions on board ship.

5. Psychiatric examinations and treatment for men showing mental disorders.

6. More and better housing facilities for men on shore.

7. Vocational guidance, so that men trained to do definite kinds of work may be directed to ships needing their services.

8. More discrimination on the part of the steamship companies in engaging men, so that men may be engaged for work they are fitted for and expect to do.

9. Better industrial relations on the part of seamen and their employers.

10. Some form of registration of seamen as they enter port. At present no record is kept of the men although about 100,000 seamen enter the port of New York alone every month.

Seamen are for the most part homeless and often friendless in the port at which they land. Many of them are wholly ignorant of the language and customs of this country. Many are unfamiliar with the living conditions which they find on shore and are often a prey to unscrupulous people. They are frequently diseased and often carriers of infection. The interest shown by the men in the center in New York shows that there is a need for a social and medical service which will enable them to profit by the time spent on shore.

The port at Philadelphia.—An employee of the division has been detailed to the port of Philadelphia during the past year. The reports of the work done with seamen at this port show 865 men infected with venereal diseases treated, of whom 293 had syphilis, 334 gonorrhea, and 238 other diseases. These men were employed on 471 vessels sailing under the American flag, the crew of these vessels numbering 18,640 men.

Other features.—A new development of the medical work in the States were the institutes held in 4 States, similar to the one held in Washington by the Public Health Service. The institutes in New Jersey, West Virginia, and New York were devoted to discussions of clinic administration and the diagnosis and treatment of venereal diseases. At the institute in Virginia all the general phases of the social hygiene problem were discussed.

Special developments of the clinical work in the States have been the organization of rural clinics. Alabama has 63 cooperative clinics covering 67 counties, where a complete course of seven doses of arsphenamine and plenty of mercury are offered at the nominal charge of \$25 to those who are able to pay, and free to those who are not. West Virginia has established 22 venereal centers, each in charge of a health officer or reliable physician. These centers are open at definite hours each week, and treatments are given at \$1 to those who are able to pay, and without charge to others. Florida has an ambulatory clinic which reaches the rural districts.

Among the other special features has been the reprinting by New York and North Carolina of the weekly case reports of the Massachusetts General Hospital for distribution among the physicians and to the clinics in these States. An effort was made to pool the orders from the other States with the result that quotations were asked by 8 States on 10,300 copies a month. Among these Wisconsin had already made arrangements to reprint the reports.

In April an article by Acting Asst. Surg. A. J. Casselman, venereal disease control officer in New Jersey, was published in the United States Public Health Reports, entitled "Diagnosis and Treatment of Syphilis and Gonorrhea." This article has since been reprinted, and is being used to supplement the civilian edition of the "Manual of Treatment of the Venereal Diseases," issued in 1919.

A number of the States have conducted surveys of institutions for the purpose of detecting and treating cases of venereal diseases found.

EDUCATIONAL MEASURES.

Owing to the decrease in the funds available to the States and the consequent decrease in personnel and supplies, the general educational activities of the States have been necessarily restricted, with

the result that reports show fewer lectures, exhibit and film showings, fewer pamphlets purchased and distributed, and consequently fewer requests for information about venereal diseases received. The most important educational activity of the division has been the Institute on Social Hygiene and Venereal Disease Control, more fully discussed on page 388 of this report. Another development has been the initiation of investigations to determine the value of various educational measures for use in combating venereal diseases.

GENERAL FEATURES.

Pamphlets.—Requests for pamphlets received by the division and State boards of health have totaled 88,558. Of 39,256 received by the service, nearly 50 per cent were referred to the State boards for compliance. Comparison of reports of work in 1921 with 1920 show a decrease of 12,534 in the number of general requests received by the division in 1921. On the other hand, requests from public officials and organizations show an increase of 3,128 in 1921, due to intensive circularizing of special groups. As no circularization of industries was undertaken until June, 1921, very few requests were received from this group.

Pamphlets distributed by the service and State boards of health in 1921 have totaled 4,118,743 as compared with 8,082,792 in 1920. Of the total distributed in 1920, 80 per cent were distributed by the State boards of health. In 1921, 93 per cent of the total was distributed by the States. In other words, 300,073 pamphlets, or only 7 per cent of the total for the year 1921, were distributed by the division. This is in accordance with the policy of centralizing this work in the States by referring to them requests for educational material received by the division whether stimulated by the service or not.

Comparison of 1920 and 1921 reports of pamphlets distributed by the States shows a decrease for 1921 in all but 13 States. This decrease in the case of New York State alone amounts to over 500,000 pamphlets.

The States report 4,081,697 pamphlets purchased or reprinted in 1921 as compared with 5,816,830 in 1920, a decrease of about 30 per cent. Increase is shown in the reports of 14 States only. A study of the following table shows that 85,050 more copies of pamphlet E for girls were purchased in 1921 than 1920, but that 221,950 fewer copies of pamphlet F for educators were purchased:

Educational pamphlets and placards purchased and reprinted by State boards of health July 1, 1920–June 30, 1921.

State.	Total.	A	B	C	D	E	F	Others.	Pla- cards.
United States.....	4,081,697	759,275	1,049,000	440,100	622,932	714,700	49,500	360,180	86,010
Alabama.....	69,000	15,000	5,000	10,000	15,000	.....	.....	23,000	1,000
Arizona.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas.....	140,000	25,000	5,000	.....	50,000	.....	10,000	50,000	.....
California.....	2,000	.....	.....	.....	.....	.....	.....	2,000	.....
Colorado.....	25,714	4,000	12,000	2,000	2,000	3,000	1,000	1,700	14
Connecticut.....	32,000	3,000	16,000	1,000	1,000	.....	1,000	10,000	.....
Delaware.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
District of Columbia....	7,000	2,000	.....	.....	.....	5,000	.....	.....	.....

Educational pamphlets and placards purchased and reprinted by State boards of health July 1, 1920-June 30, 1921—Continued.

State.	Total.	A	B	C	D	E	F	Others.	Pla- cards.
Florida.....	29,000	5,000	6,000	.....	6,000	10,000	1,000	1,000	.....
Georgia.....	60,941	.....	15,000	.....	12,000	23,000	.....	10,565	376
Idaho.....	15,000	.....	.....	.....	.....	15,000	.....	.....	.....
Illinois.....	180,500	60,000	50,000	20,000	10,000	15,000	5,000	20,500	.....
Indiana.....	67,150	.....	15,000	25,000	10,000	5,000	.....	11,000	1,150
Iowa.....	50,000	.....	.....	.....	25,000	25,000	.....	.....	.....
Kansas.....	4,000	.....	.....	2,000	.....	.....	.....	2,000	.....
Kentucky.....	10,200	.....	.....	.....	.....	10,000	.....	.....	200
Louisiana.....	65,065	5,000	37,000	.....	2,000	7,000	.....	14,065	.....
Maine.....	20,029	.....	.....	.....	.....	10,000	.....	10,000	29
Maryland.....	239,915	75,775	30,000	25,100	35,350	71,200	.....	100	2,390
Massachusetts.....	46,700	15,000	1,000	8,000	8,500	5,000	4,000	5,200	.....
Michigan.....	91,500	30,000	.....	15,000	35,000	10,000	.....	1,500	.....
Minnesota.....	179,040	35,000	20,000	35,000	15,000	55,000	4,000	15,000	40
Mississippi.....	378,132	115,000	123,000	.....	100,932	15,000	20,000	4,200	.....
Missouri.....	235,790	50,000	57,000	28,000	25,000	40,000	.....	12,500	23,290
Montana.....	55,000	10,000	25,000	.....	.....	10,000	.....	10,000	.....
Nebraska.....	101,000	10,000	29,000	.....	.....	25,000	.....	37,000	.....
Nevada.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire.....	18,000	3,000	.....	.....	5,000	10,000	.....	.....	.....
New Jersey.....	20,133	8,000	5,000	.....	5,000	1,000	.....	1,050	83
New York.....	445,124	85,000	115,000	15,000	130,000	100,000	.....	1,000	124
New Mexico.....	17,324	3,500	7,300	2,000	1,000	3,500	.....	.....	24
North Carolina.....	409,400	50,000	209,400	50,000	.....	50,000	.....	50,000	.....
North Dakota.....	12,000	2,000	.....	.....	.....	5,000	.....	.....	.....
Ohio.....	320,000	60,000	70,000	70,000	60,000	60,000	.....	.....	.....
Oklahoma.....	17,000	5,000	.....	.....	10,000	.....	.....	2,000	.....
Oregon.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania.....	41,000	.....	21,000	10,000	.....	10,000	.....	.....	.....
Rhode Island.....	10,500	3,000	3,000	.....	3,000	1,000	500	.....	.....
South Carolina.....	16,250	.....	1,000	5,100	5,150	5,000	.....	.....	.....
South Dakota.....	10,000	.....	10,000	.....	.....	.....	.....	.....	.....
Tennessee.....	98,550	5,000	35,000	10,000	5,000	15,000	.....	28,550	.....
Texas.....	185,000	10,000	110,000	6,000	35,000	20,000	3,000	1,000	.....
Utah.....	1,000	.....	.....	.....	.....	.....	.....	1,000	.....
Vermont.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Virginia.....	54,430	5,000	7,300	10,000	7,000	20,000	.....	.....	5,130
Washington.....	27,120	.....	.....	16,000	4,000	5,000	.....	.....	2,120
West Virginia.....	9,290	5,000	4,000	.....	.....	.....	.....	250	40
Wisconsin.....	263,900	55,000	.....	74,900	.....	50,000	.....	34,000	50,000
Wyoming.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

As was the case in 1920, the publication of educational material by the service has been greatly curtailed by restrictions regarding printing. In 1921 the following new venereal disease bulletins have been issued:

56. Percentage of Venereal Diseases among White Soldiers.
57. Relative Standing of 444 Cities.
60. Healthy, Happy Womanhood.
62. Outdoing the Ostrich.
64. A Square Deal for the Boy in Industry.
65. Two Years Fighting Venereal Diseases.
66. What Representative Citizens Think about Prostitution.

With the exception of No. 60, written especially for girls, these pamphlets are all of general interest. No. 65 is a review of the work of venereal disease control for the first two years. The use of pictures and graphs and the numerous incidents given has made this one of the most attractive pamphlets prepared by the division.

The following pamphlets issued in 1921 were revisions of earlier pamphlets:

61. Sex Education in the Home.
63. Facts about Venereal Diseases.
- 12-20. A second revision of the Industrial Program.

In addition to the pamphlets given above three illustrated leaflets describing the exhibits were issued:

Youth and Life (illustrating the girls' exhibit).

Keeping Fit (illustrating the colored boys' exhibit).

To Employers in Industry (briefly describing the girls' and the two boys' exhibits).

Cooperative relations with the American Social Hygiene Association have been maintained throughout the year. The exhibits and many of the pamphlets prepared by the service have been issued by the association, which has made it possible for the States to secure better editions than those issued by the Government Printing Office.

Exhibits.—The "Youth and Life" exhibit for girls was issued in the fall of 1920, after long and careful preparation. Except for one in use in the State of Minnesota no exhibit for girls had ever been issued in which the subjects of sex hygiene and venereal diseases were presented. In preparing the outline and selecting the text and illustrations, the division consulted experts in education, sociology, biology, psychology, as well as many lay workers with girls. The result, judging from the almost universal commendation of the exhibit and the extensive use which has been made of it, not only by State boards of health, but by schools, organizations, and workers with girls generally, would seem to justify all the effort put into its preparation.

The colored boys' "Keeping Fit" exhibit has also been completed and is being used in work with colored groups. Much preliminary work has been done on a colored girls' exhibit, which will probably be issued this fall.

A miniature edition of the "Keeping Fit" exhibit has been issued, each exhibit consisting of 48 cards, 9 by 12 inches in size. This exhibit promises to be very popular in the handling of small groups because of its convenient shape. It is also available at very little expense.

The States report 629 sets of exhibits borrowed from the Public Health Service, or purchased, compared with 491 in 1920. The number of showings under State auspices has decreased about 46 per cent. This is partly due to the general decrease in educational activities and partly to the custom of using the exhibits with lectures. When this is done the meeting is classified as a lecture. Reference to the table giving State activities on page 379 shows 2,258 meetings listed as lectures at which exhibit material was used. Reports of exhibit showings give a total of 4,442 with an average attendance of 230 for the United States in 1921.

Lantern slides.—The supply of adult and boys' slides has been exhausted. New sets will be issued as soon as the outlines have been revised. Plans are also under way for a set of slides for girls to correspond with the exhibit. The States report the purchase of 29 sets of slides for 1921. Showings of slides have been included with those of the exhibits.

Motion-picture films.—The States report 136 films purchased or borrowed in 1921 as compared with 70 so secured in 1920. It is probable that the films include the new films issued by the American Social Hygiene Association, which are better suited to educational work than those issued during the war. Total showings for the year were 1,684, with an average attendance of 261.

As a part of the division's program of work with the adolescent-age group, much time and thought is being spent on preparing films suitable for showings in schools, graded for use with various age groups. The work is well under way, and an extensive report of it will be made next year.

Following is a table giving the amount of exhibit material secured by the State boards of health in 1920:

Exhibits, lantern-slide sets, and motion-picture films borrowed or purchased by State boards of health July 1, 1920-June 30, 1921.

State.	Exhib-its.	Slides.	Films.	State.	Exhib-its.	Slides.	Films.
United States.....	629	29	136	Montana.....			2
Alabama.....	2		1	Nebraska.....	10		3
Arizona.....				Nevada.....			
Arkansas.....	10			New Hampshire.....			
California.....	1			New Jersey.....	4		27
Colorado.....	8	6	6	New York.....	150		2
Connecticut.....			1	New Mexico.....	6	4	2
Delaware.....				North Carolina.....	16		
District of Columbia.....				North Dakota.....	6		1
Florida.....	1		4	Ohio.....			24
Georgia.....	2		1	Oklahoma.....			
Idaho.....	3			Oregon.....			
Illinois.....	34		2	Pennsylvania.....			1
Indiana.....	20	1	8	Rhode Island.....	2		3
Iowa.....	2			South Carolina.....			
Kansas.....	6		1	South Dakota.....		3	
Kentucky.....	1		1	Tennessee.....	24		28
Louisiana.....	21		3	Texas.....	10	1	
Maine.....		10	6	Utah.....	1		
Maryland.....	5		4	Vermont.....			
Massachusetts.....	20			Virginia.....	5	2	1
Michigan.....	16			Washington.....	3		2
Minnesota.....	127			West Virginia.....	1		
Mississippi.....	42			Wisconsin.....	41	2	1
Missouri.....	29		1	Wyoming.....			

The American Social Hygiene Association reports that of the exhibits sold to State boards of health 153 were "Youth and Life" exhibits and 303 the miniature "Keeping Fit" exhibit. Including sales to the State boards of health, the Association's report is as follows:

	Keeping Fit (large).	Keeping Fit (small).	Youth and Life.	Venereal Menace.
Total.....	84	591	208	58
State boards of health.....	45	303	153	42
Y. M. C. A.'s.....	16	220	6	1
Schools.....	3	22	20	
Industrial plants.....	8	9	3	
Individuals.....	12	37	26	15

Lectures and addresses—A total of 8,991 lectures and addresses with an average attendance of 136 have been reported to the division, at 2,271 of which exhibit material was used. Compared with the reports of 1920, this is a decrease of 27 per cent.

The following table gives a complete report of the educational activities carried on by the State boards of health:

State report of educational activities, July 1, 1920-June 30, 1921.

State.	Pam- phlets dis- tributed.	Lectures.			Film showings.		Exhibit and slide showings.	
		Number.	Average attend- ance.	Exhibit material used.	Number.	Average attend- ance.	Number.	Average attend- ance.
United States..	3,818,670	8,384	130	2,258	1,612	256	4,417	259
Alabama.....	65,521	222	146	.....	36	296	3	280
Arizona.....	421	1	25	.....	.....	.....	.....	.....
Arkansas.....	66,570	169	161	32	55	255	466	199
California.....	67,158	274	92	4	44	390	80	61
Colorado.....	53,271	145	117	53	32	186	43	451
Connecticut.....	37,871	62	250	53	4	300	.....	.....
Delaware.....	210	.....	.....	.....	.....	.....	.....	.....
District of Columbia..	6,700	37	131	30	1	26	5	258
Florida.....	29,625	239	151	175	.....	.....	.....	.....
Georgia.....	110,615	241	140	16	47	721	84	162
Idaho.....	6,366	17	270	.....	.....	.....	.....	.....
Illinois.....	306,151	311	219	143	54	252	55	1,852
Indiana.....	91,532	273	161	.....	147	160	24	210
Iowa.....	39,374	491	158	30	69	264	33	4,993
Kansas.....	38,277	399	87	381	.....	.....	13	106
Kentucky.....	67,035	47	212	8	28	179	388	.....
Louisiana.....	63,931	251	148	132	3	200	.....	.....
Maine.....	22,895	152	172	49	9	63	119	.....
Maryland.....	77,598	214	116	186	.....	.....	397	38
Massachusetts.....	46,745	78	10	22	2	125	21	104
Michigan.....	87,931	403	82	35	147	194	186	532
Minnesota.....	91,190	35	41	.....	93	246	316	153
Mississippi.....	238,102	276	218	119	13	340	368	23
Missouri.....	179,285	59	123	1	21	471	147	96
Montana.....	48,327	6	60	.....	.....	.....	.....	.....
Nebraska.....	109,186	45	132	.....	111	159	107	25
Nevada.....	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire.....	4,979	20	81	.....	2	62	57	44
New Jersey.....	84,390	233	109	108	1	350	.....	.....
New York.....	496,459	590	99	.....	110	289	306	402
New Mexico.....	9,812	26	16	.....	14	379	.....	.....
North Carolina.....	290,182	715	129	480	2	102	98	293
North Dakota.....	9,648	8	58	2	11	439	3	47
Ohio.....	241,886	16	64	.....	11	61	.....	.....
Oklahoma.....	31,749	18	125	.....	6	395	15	318
Oregon.....	18,544	769	57	.....	56	201	.....	.....
Pennsylvania.....	101,166	91	198	.....	87	431	117	214
Rhode Island.....	3,995	24	175	2	1	500	.....	.....
South Carolina.....	9,807	.....	.....	.....	.....	.....	150	182
South Dakota.....	20,374	137	164	81	9	279	12	90
Tennessee.....	75,886	151	152	18	46	117	86	126
Texas.....	91,763	9	94	.....	15	191	15	100
Utah.....	21,926	6	150	5	2	200	56	1,457
Vermont.....	5,320	3	73	1	.....	.....	2	80
Virginia.....	53,070	272	197	83	2	99	.....	.....
Washington.....	54,731	74	186	9	62	151	56	132
West Virginia.....	70,625	88	147	.....	54	247	240	70
Wisconsin.....	168,685	663	112	.....	204	240	346	250
Wyoming.....	1,783	25	106	.....	1	85	3	131

Conferences.—Sixteen conferences with educators having an average attendance of 243 have been held in 1921. Although this is a decrease from 1920, the conferences have covered an area in the West and South which has not been reached heretofore.

Publicity.—A total of 4,192 articles have been furnished magazines and journals, mostly publications by organized labor unions. The division has received 176 copies of journals and magazines having a circulation of 1,780,795 containing material on venereal diseases by the service. Publicity has also been given in 1921 as in 1920 to the venereal disease bulletins through the section of public health education.

SPECIAL FEATURES.

Educators.—In the field of sex education, which the Public Health Service believes is one of the most important preventive measures in the control of the venereal diseases, considerable progress has been made during the past year. Educators now generally recognize the importance of this problem and are of themselves seeking a solution. This is indicated by a greater readiness to consider the subject at teachers' conferences and by increased efforts to prepare teachers for this important work.

At the meetings of the National Education Association during the year the subject of sex education received considerable attention. Among the resolutions passed at the Salt Lake City conference, July, 1920, was the following:

We favor the teaching of social hygiene in all teacher-training institutions and recommend the coöperation of teachers with all organizations of parents in the instruction necessary to the inculcation of sound ideas and attitudes in children and youth.

A special meeting devoted to the subject was held at the Atlantic City meeting of the department of superintendence, February, 1921. Speakers have also been furnished by the service at several State teachers' meetings.

The conferences, arranged for the specific purpose of placing before high-school principals, teachers, and others interested the need, opportunities, and methods of education in relation to sex, have been continued. They have, however, assumed more and more a local character. Four conferences, for instance, were held in California and four in Texas. Normal schools, colleges, and other educational institutions in the vicinity of the places where conferences were held were visited. Following is the list of the conferences:

Date.	City and State.	Scope.	Attendance.
1920.			
Nov. 12-13.....	Grand Forks, N. Dak.....	Interstate.....	106
1921.			
Feb. 18-19.....	Columbus, Ohio.....	Local.....	50
Feb. 26.....	Atlantic City, N. J.....	National Education Association..	75
Mar. 21-22.....	Lincoln, Nebr.....	State.....	75
Mar. 23.....	Cheyenne, Wyo.....	do.....	85
Mar. 30.....	Reno, Nev.....	do.....	125
Apr. 1.....	San Francisco, Calif.....	Local.....	300
Apr. 2.....	Oakland, Calif.....	do.....	515
Apr. 5.....	San Diego, Calif.....	do.....	900
Apr. 8-9.....	Los Angeles, Calif.....	do.....	850
Apr. 18.....	El Paso, Tex.....	do.....	260
Apr. 20.....	San Antonio, Tex.....	do.....	105
Apr. 22-23.....	Houston, Tex.....	do.....	50
Apr. 25.....	Waco, Tex.....	do.....	145
Apr. 29-30.....	Oklahoma City, Okla.....	State.....	40
May 13-14.....	Columbia, S. C.....	do.....	170

Many teacher-training institutions are now making efforts to prepare their students for work in the field of sex education. A questionnaire on the status of sex education in college and normal schools, with special reference to the preparation of teachers, was sent out, but the results have not yet been tabulated. Columbia University, with the cooperation of the service among other agencies, conducted a very successful series of courses on social hygiene edu-

cation at their 1920 summer school. Inquiry among the leading summer schools of the country shows that many more are undertaking this work in 1921. The division has prepared and distributed an outline on sex instruction and guidance for high school pupils for the use of instructors at summer schools.

The service is represented on the committee on the school health program of the American Public Health Association.

A project has been developed for the production of 12 reels of motion pictures. These will present some of the general biological and physiological principles upon which modern hygienic and sanitary practice rest, the essential idea about communicable diseases, personal hygiene, and heredity and eugenics. These films will be chiefly but not solely for the use of educational institutions.

Industries.—Work with the Industrial Program was not pushed in 1921. One contact, however, should be mentioned:

In the fall of 1920, venereal-disease control work was begun with the Loyal Legion of Loggers and Lumbermen, an organization with about 40,000 members, operating in the four Northwest States—Washington, Oregon, Idaho, Montana. A division representative was sent to Portland to organize the work which was later carried on with the cooperation of the State venereal-disease control officers in these States and the sanitary officer of the organization. Meetings were held in many of the lumber camps at which talks were given and films and exhibits shown. Several articles furnished by the division were published in the "4L", the official publication of this organization, having a circulation of between 25,000 and 30,000.

About 1,000 copies of the Industrial Program were distributed prior to June 1, 1921. At this time the revised program was sent out to the extent of 10,000 copies. Following is an account of the sales made during the year:

	Total orders placed.	Total pieces purchased.	Pamphlets purchased.		Unframed placards purchased.		Framed placards purchased.	
			Men.	Women.	Men.	Women.	Men.	Women.
United States..	73	84,763	51,770	21,575	10,145	73	790	410
By State boards of health.....	9	69,900	46,700	17,500	5,000	.....	450	250
By industrial firms...	64	14,863	5,070	4,075	5,145	73	340	160

Industrial questionnaires were returned by 474 firms representing a total employed force of 41,667. Of the firms returning questionnaires, 360 were willing to cooperate with the State boards of health by posting placards, distributing pamphlets, and in other ways.

Labor organizations.—In the fall of 1920 a systematic circularization of organized labor groups was undertaken by the division with the cooperation of the American Federation of Labor. Letters containing pamphlets and requests for cooperation were sent to the following groups:

National and international unions:

Affiliated with the American Federation of Labor.....	110
Unaffiliated with the American Federation of Labor.....	50

Total	160
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City central labor councils.....	950
Federal trade and labor unions.....	1, 115
Local branches of national and international labor organizations.....	10, 990
Labor journals and magazines.....	300

The results of this circularization were most gratifying. Questionnaires were returned by 29 national and international organizations having a total membership of over 2,000,000 in approximately 16,500 local branches. Contacts with other national groups were established through their journals, by personal interviews, and in other ways. The local branches of 26 of these organizations were completely circularized. Replies received from these locals and from the city central labor councils totaled 2,050. These replies included 402 requests for a special message to be read in meeting, 1,581 requests for addresses of clinics, and requests for a total of 439,704 pamphlets for distribution among the members of the unions. Among the unions circularized were:

National Association of Letter Carriers.
 International Brotherhood of Electric Workers.
 International Association of Machinists.
 Brotherhood of Locomotive Engineers.
 Bricklayers, Masons and Plasterers' International Union.

As a result of interviews with the secretaries of the following organizations, plans are being outlined for definite work with their locals on a more intensive scale:

United Mine Workers of America.
 United Brotherhood of Carpenters and Joiners.

The circularization of labor journals and publications resulted in the publication by approximately 100 journals of the news sheets furnished bimonthly by the division. The total circulation of these journals is 1,996,000.

Work in the cities graded.—After several conferences with State health officers, it was decided not to attempt another grading of the cities surveyed in 1920. Instead, a series of letters was sent out through the State boards of health to the mayors calling their attention to the results of the survey.

In order to secure an expression of opinion from the people of these cities on the question of prostitution, segregation, and medical supervision of prostitutes, a questionnaire was sent through the mayors to representative citizens. Later the same questionnaire was sent through the city central labor councils to labor representatives in the same cities, and others where central labor unions were operating.

As a result of both circularizations 1,707 questionnaires were received from 572 cities. The following is a classification of the replies according to occupation:

Representatives of amusement trades.....	27
Bankers.....	89
Representatives of building trades.....	356
Representatives of chambers of commerce.....	84
Chiefs of police.....	127
Representatives of clerical trades.....	15
Representatives of culinary and provision trades.....	58
Federal, State and municipal employees.....	74
Representatives of metal trades.....	169
Representatives of mining trades.....	47

Representatives of needle and textile trades.....	15
Representatives of printing trades.....	76
Representatives of transportation trades.....	164
Representatives of women's organizations.....	84
Miscellaneous.....	283
Occupation not given.....	39

Total 1,707

Among the questions asked by the questionnaire and the replies received were the following:

The Public Health Service and the State boards of health believe that open houses of prostitution are a menace to public health and should be abolished. Do you agree?

Yes.....	1,172
No.....	494
No answer.....	41

1,707

Or do you believe that there should be a segregated district in which prostitutes should be allowed to ply their trade?

No.....	944
Yes.....	707
No answer.....	56

1,707

In general it may be said that those replying to the questionnaire favored the abolition of prostitution because of the danger presented by it to the public health. Those favoring segregation did so from the belief that frequent medical examination of the inmates of the districts would furnish the best protection to the health of the community. Along this line further education is needed, and the division is planning to reply to each questionnaire by sending a tabulated report of the answers received and a copy of "The Case Against the Red Light."

Educational research.—One of the outstanding features of the educational work of the division during the past year has been the beginning of a scientific study of the effect of various educational measures upon the incidence of venereal-disease infection. A series of indices are being prepared with the cooperation of the State boards of health, whereby it is hoped that progress over a series of years may be measured. These indices utilize features common to all the States, such as reporting by physicians, incidence of acute and chronic cases, laboratory examinations, admissions to hospitals, penal, and eleemosynary institutions. These reports will be applied nationally, no comparison of States being involved.

Minor studies include, among others, a questionnaire follow-up of the social hygiene field car used in North Carolina and Florida; measurements of the effects produced by showings of the "Keeping Fit" exhibit.

In the District of Columbia.—A representative of the division was detailed to assist the department of health of the District of Columbia and the District Social Hygiene Society develop educational work in Washington. Meetings were held in the various community centers of the city, with citizens' associations, and other groups—41 in all.

Work with the colored population.—Four States were covered by the colored personnel of the division during the past year, Georgia,

Louisiana, Mississippi, and Tennessee. Local work was done in several other States. At the completion of the work in Georgia a conference was held to discuss results and to take steps to keep the work going. Reports of 508 lectures with an average attendance of 213 have been reported by colored workers of the division. The national colored organizations covered have been:

Circle for Negro Relief.

Interstate Dental Association.

National Association of Teachers in Colored Schools.

National Convention of Congregational Workers.

National Medical Association.

Special State activities.—The use of the "Healthmobile" for intensive field educational work was a distinctive feature of the educational work in North Carolina and Florida. The social hygiene institute in Virginia, to which reference has already been made, should also be mentioned in connection with the educational work of the States. Arkansas reports that a venereal-disease program has been presented to more than half the teachers of the State through the summer normal courses conducted by the State department of education. Connecticut reports using the "Help wanted" columns and the reporting pages of the newspapers to advertise clinics, with good results.

LAW ENFORCEMENT MEASURES.

That the people of the country are beginning to appreciate the importance of organized work for the purpose of controlling venereal diseases and to realize that legislative support is needed for this work is shown by the number of laws passed by the States, in which legislative sessions were held, which have a direct bearing on the question of venereal disease control. The law enforcement activities of the division in 1921 have included giving legal advice where needed by the various States and by conducting investigations in special localities at the request of the State health officers.

STATE LEGISLATION.

The appropriations passed by 36 States have already been discussed.

Besides the appropriations made, laws providing for the control of venereal diseases were passed in 28 States. A complete review of legislation enacted follows:

Arizona:

1. Appropriation of \$6,000 for venereal disease control purposes for next two fiscal years.

Arkansas:

1. Appropriation of \$25,000 for venereal disease control purposes for two next fiscal years.

California:

1. Appropriation of \$51,600 for Bureau of Social Hygiene.

Colorado:

1. Appropriation of \$25,000 for the purpose of maintaining State home for detention and treatment of women infected with venereal disease.
2. Amendment to the present venereal disease law, giving the Director of the Venereal Disease Division additional authority concerning treatment and care of venereal disease cases in all State institutions, removing ambiguity in the law, and increasing the annual appropriation for this division from \$8,500 to \$20,000.

Connecticut:

1. Law preventing ophthalmia neonatorum.
2. Appropriation of \$20,000 for venereal disease control purposes.

Idaho:

1. Fornication law.
2. Law prohibiting advertising of venereal disease nostrums.
3. Act preventing ophthalmia neonatorum.
4. Venereal disease control law.
5. Law prohibiting traveling carnival companies.
6. Appropriation of \$5,000 for venereal disease control purposes.

Illinois:

1. Appropriation of \$200,000 for next two years for venereal disease control work.

Indiana:

1. Law prohibiting institutions, supported wholly or in part by State funds, from refusing admission on account of venereal disease.
2. Appropriation of \$84,600 for two years beginning October 1, 1921, for venereal disease control purposes.
3. Appropriation of \$25,000 for venereal disease control purposes, for period ending October 1, 1921.

Iowa:

1. Law raising "age of consent" to 17 years and making same applicable to both sexes.
2. Appropriation of \$25,000 annually for two years for venereal disease control purposes.

Kansas:

1. Appropriation of \$20,000 for laboratory and venereal disease control work for two years.

Maine:

1. Law prohibiting advertisements of venereal disease nostrums.
2. Appropriation bill \$10,000 for venereal disease control purposes.

Massachusetts:

1. Appropriation of \$42,536 for venereal disease control purposes.

Michigan:

1. Amendment to venereal disease control law.
2. Appropriation of \$51,500 for each of next two fiscal years for venereal disease control purposes.

Minnesota:

1. Act providing for examination and treatment for venereal disease of persons convicted of violating certain laws.
2. Appropriation of \$30,000 per year for the next two fiscal years for the division of venereal diseases of the State board of health.

Missouri:

1. Act to prevent ophthalmia neonatorum.
2. Injunction and abatement in modified form.
3. Appropriation of \$19,000 for venereal disease control purposes.

Montana:

1. Appropriation of \$11,070 for venereal disease control purposes for 28 months ending June 30, 1923.

Nebraska:

1. Appropriation of \$32,740 for venereal disease control purposes.
2. Act relating to pandering and intrastate white-slave conditions.
3. Amendment to law prohibiting advertising of venereal-disease cures.
4. Law making it a felony for any person to debauch or aid in debauching any boy under 21 years of age.
5. Amendment to act dealing with commitment of women to State reformatory; requiring mental and physical examination of all inmates and provision for commitment of those found feeble-minded to institution for feeble-minded.

Nevada:

1. Act prohibiting advertisement of venereal-disease nostrums.
2. Act to prevent ophthalmia neonatorum.

New Hampshire:

1. Marriage fitness act.
2. Appropriation of \$6,000 for venereal disease control purposes.

New Jersey :

1. Law to the effect that no license to marry shall be issued to any persons infected with a venereal disease in a communicable form.
2. Appropriation of \$35,000 for venereal disease control purposes, provided no Federal aid is received. If Federal aid is allotted \$25,000 will be appropriated.

New Mexico :

1. Vice-repressive act.
2. Injunction and abatement act.
3. Act to prevent ophthalmia neonatorum.
4. Creation of department of public welfare in which State department of health is included as bureau of public health.
5. Appropriation of \$1,944 for venereal disease control purposes.

New York :

1. Appropriation of \$102,980 for venereal disease control purposes.

North Carolina :

1. Act requiring male applicant for marriage to present certificate showing nonexistence of venereal diseases, or tuberculosis in infectious state, and that applicant has not been adjudged an idiot, imbecile, or of unsound mind. Female applicant required to present certificate showing nonexistence of same disabilities except venereal disease.
2. Appropriation of \$20,606 for next year and \$13,712.12 for the following year for venereal disease control purposes.

North Dakota :

1. Appropriation of \$12,548.48 for venereal disease control purposes for next two fiscal years.

Ohio :

1. Appropriation of \$25,000 for venereal disease control purposes.

Oklahoma :

1. Act to prevent ophthalmia neonatorum.
2. Appropriation of \$15,500 for venereal disease control purposes.

Oregon :

1. Appropriation of \$60,000 for care, maintenance, and rehabilitation of venereally infected women at Portland Detention Hospital.
2. Appropriation of \$30,000 for the Oregon Social Hygiene Society, authorizing the society to set apart enough money for State to qualify for Federal assistance.
3. In appropriation for State board of health provision is contained authorizing State board of health to set aside sufficient sum to enable State to qualify for Federal assistance, and such sum is expressly appropriated for prevention, control, and treatment of venereal disease.

Pennsylvania :

1. Appropriating all Federal moneys allotted Pennsylvania for venereal disease control purposes to State department of health for prevention, control, and treatment of said diseases.
2. Act relative to powers of quarantining places and persons, giving State board of health additional quarantine powers in handling persons infected with contagious diseases.
3. Requiring all persons confined in any State, county, or city penal or reformatory institution, or place of detention, to be examined for, and if infected, treated for venereal diseases.
4. Act prohibiting advertisement of venereal-disease nostrums or treatment.
5. Providing for the quarantine and for the reception, detention, care, and treatment of persons suffering with syphilis at and in State hospital for chronic insane.
6. Appropriation to State department of health portion of which will be assigned for venereal disease control purposes.
7. Injunction and abatement law.
8. Appropriation of \$300,000 for venereal disease control purposes.

Rhode Island :

1. Venereal disease control act.
2. Appropriation of \$5,000 for venereal disease control purposes.

South Carolina :

1. Act raising "age of consent" from 14 to 16 years.
2. Marriage fitness act passed by House and continued by Senate to next session.
3. Appropriation of \$33,886 for venereal disease control purposes for next fiscal year.

South Dakota :

1. Amendment to venereal disease control law.
2. Appropriation of \$12,000 for venereal disease control purposes.

Tennessee :

1. Venereal disease control act.
2. Appropriation of \$25,956.72 for venereal disease control purposes for two years.

Texas :

1. Act to prevent ophthalmia neonatorum.
2. Act prohibiting employment of persons with contagious diseases in food establishments.
3. Act prohibiting employment of persons with contagious diseases in barber shops or beauty parlors.

Utah :

1. Appropriation of \$3,600 for venereal disease control purposes.

Vermont :

1. Appropriation of \$4,000 for venereal disease control purposes.
2. Law prohibiting advertising and sale of venereal disease nostrums.

Washington :

1. Prohibiting advertisements of venereal disease nostrums.
2. Appropriation of \$126,000 for State Women's Industrial Home and Clinic. Vetoed by governor.

West Virginia :

1. Venereal disease control law.
2. Act raising the "age of consent" to 16 years.
3. Act providing for the admission of girls to correctional institutions, forbidding such institutions from refusing admission because of the presence of venereal disease and requiring treatment to be administered when needed.
4. Appropriation of \$10,000 for venereal disease control purposes.

Wisconsin :

1. Act permitting State, city and local health departments to advertise clinics and methods for the prevention of venereal diseases.
2. Amendment to vice repressive act.
3. Appropriation of \$41,250 for venereal disease control purposes for each of two years 1922-23.

Wyoming :

1. Vice repressive act.
2. Act prohibiting advertising of venereal disease nostrums.
3. Creating State law-enforcement department.
4. Injunction and abatement act.
5. Act to prevent ophthalmia neonatorum.
6. Marriage fitness act.
7. Venereal disease control law.
8. Act making it unlawful to keep a house of ill fame or knowingly let or permit the use of house for prostitution or lewdness.
9. Act requiring physical examination of children before admission to State institutions.
10. Act providing for full-time health officer.
11. Appropriation \$8,600 for salary and expenses of full-time venereal disease control officer for two years.

A study of this review shows that 2 States passed a vice-repressive act, 3 States an injunction and abatement law, 5 States a venereal disease control law, 8 States a law preventing ophthalmia neonatorum, 7 States a law prohibiting the advertising of nostrums, 4 States a marriage fitness act, and 3 States an act raising the "age of consent."

CITY ORDINANCES.

The passage of 28 city ordinances has been reported for 1921.

THE INSTITUTE ON VENEREAL DISEASE CONTROL AND SOCIAL HYGIENE.

The awakened interest of both men and women in regard to the medical and social problem of venereal disease, bound up as its solution is with sex hygiene and sex education, was strikingly in evidence at this institute, conducted by the Public Health Service, November 22 to December 4, 1920, in Washington.

Not only was the attendance about three times as large as had been expected (about 200 persons were expected, while the final enrollment numbered 617), but those attending were drawn from communities widely scattered over the United States, and six foreign countries were represented in the gathering.

The aim of the institute was to make available to those employed in one or another capacity in the attack upon venereal diseases, such as physicians, social workers, nurses, and educators, the most recent contributions to knowledge and experience along these lines, and to enable them to get into personal contact with those recognized to be the highest authorities on the various scientific and professional phases of the work.

As medicine, biology, psychology, and sociology must all contribute to venereal disease control, the courses of instruction covered a wide field. They included the treatment of syphilis and gonorrhea, with demonstrations at Freedman's Hospital, a course on clinic management, and a special course of instruction for nurses dealing with clinic nursing and social work. Other courses were as follows: The delinquent and the law, the psychology of the delinquent, sex in relation to education, protective work for girls, heredity and eugenics, sociology and social hygiene, methods of public education, psychology and sex.

To give this instruction the service organized a faculty comprising 54 of the ablest men and women who have been at work on these subjects in the United States. Lectures were given and round table conferences held for general discussion. Those who attended the institute were unanimous in their appreciation of the knowledge gained and the inspiration received from the men and women of the faculty and from each other.

This personal contact was important for those registered at the institute were without exception men and women vitally interested in venereal disease control and actively engaged in some phase of the work or related occupation. They were a representative body coming from 43 States, the District of Columbia, Philippine Islands, Canada, Chile, Mexico, Peru, and Switzerland.

From the data furnished on registration cards it was possible to classify 602 of the total 617 registered, according to sex and occupation. Of those registered 346 were men and 256 were women.

In explanation of the table given below it may be pointed out that the largest class consisted of 168 physicians, registered solely as physicians without reference to their attachment to health work. There were also 32 clinicians and 29 health officers. Some of those listed as employed by the Public Health Service, Interdepartmental Social Hygiene Board, and American Social Hygiene Association and not included in any of the above classifications were also physicians. It is, therefore, seen that a good deal more than one-third of the total registration was composed of members of the medical pro-

fession. There were 76 social workers, 57 nurses, and 19 police women who attended. A complete tabulation follows:

Occupations of those registering at the institute on venereal disease control and social hygiene.

	Male.	Fe- male.		Male.	Fe- male.
Physicians.....	139	29	Students.....	2	1
Nurses.....		57	Lawyers.....	3	
Clinicians.....	31	1	Deputy collector internal revenue.....	1	
Health officers.....	29		Insurance man.....	1	
United States Public Health Service.....	60	21	Manager advertising agency.....	1	
Interdepartmental Social Hygiene Board.....	14	19	Psychologist.....		2
American Social Hygiene Association.....	9	1	Bacteriologist.....		1
Employees of State boards of health.....	5	2	Epidemiologist.....		1
Officers of State social hygiene societies.....	2	2	Radiologist.....	1	
Field workers.....	2	6	Statisticians.....	2	1
Social workers.....	17	59	Lecturers.....	3	3
Educational workers.....	2		Superintendents industrial schools, reform schools, etc.....		8
Religious workers.....		1	Hospital superintendent.....	1	
Policewomen.....		19	Pharmacists.....	2	
Policeman.....	1		Dentist.....	1	
Police matron.....		1	Military officers.....	6	
Teachers.....	7	7	Military intelligence.....		1
Probation officers.....	3	9	Editor.....		1
Judge.....	1		Journalist.....		2
Referee, juvenile court.....		1		316	256

Total male registrations.....	346
Total female registrations.....	256
Unclassified registrations.....	15
Total.....	617

Those who attended the institute were so impressed with the value of it to themselves that many requests have come to the service for similar institutes to be held in various parts of the country where a large attendance of local workers might be had. For this reason plans are under way for a series of institutes, 24 in all, to be held in central points of all sections of the country. Where the State health officers request it, these institutes will cover other public health problems in addition to that of venereal disease control. In this way those interested, professionally or otherwise, in public health activities will be given an opportunity to come in touch with the latest results of scientific thought on the many problems to be solved in the country at large.

STATISTICAL SUMMARY.

The following table summarizes all the activities in the control of venereal diseases for the past three years, 1919-1921:

Statistical summary of activities in the control of venereal diseases, comparative table showing the fiscal years 1919, 1920, and 1921.

	1919	1920	1921
<i>Medical activities.</i>			
I. Cases of venereal diseases reported to State boards of health:			
A. Gonorrhea.....	131, 193	172, 387	203, 281
B. Syphilis.....	100, 466	142, 869	217, 817
C. Chancroid and others.....	7, 843	10, 861	13, 606
Total.....	239, 502	326, 117	434, 704

Statistical summary of activities in the control of venereal diseases, comparative table showing the fiscal years 1919, 1920, and 1921—Continued.

	1919	1920	1921
<i>Medical activities—Continued.</i>			
II. Doses of arsenphenamine (or similar product) administered by State boards of health.....	1 118,055	328,382	532,778
III. Clinics:			
A. Clinics operating under joint control of State boards of health and the Public Health Service.....	237	427	483
B. Clinics included under A established during the year.....	145	190	90
C. Clinics reporting activities.....	167	383	442
D. Reports received from clinics—			
(1) Patients admitted.....	59,092	126,131	140,748
(2) Patients discharged as noninfectious.....	6,922	34,215	55,467
(3) Treatments given.....	527,392	1,576,542	.....
(4) Wassermann tests made.....	63,929	175,872	251,885
(5) Microscopic examinations made for gonococcus infection.....	89,419	155,275	185,325
<i>Educational activities.</i>			
I. Pamphlets:			
A. Requests for pamphlets received—			
(1) By the Public Health Service from—			
(a) Individuals.....	48,855	41,617	29,083
(b) Public officials and organizations.....	26,877	6,491	9,619
(c) Industrial and commercial organizations.....	1,566	3,211	554
Total.....	77,298	51,319	39,256
(2) By State boards of health from—			
(a) The Public Health Service for compliance.....	19,032	32,519	18,346
(b) The public.....	174,683	103,515	49,302
Total.....	193,715	136,034	67,648
(3) Gross total requests for pamphlets received..	271,013	187,353	106,904
Minus requests received by State boards of health from the Public Health Service...	19,032	32,519	18,346
(4) Net total requests for pamphlets received...	251,981	154,834	88,558
B. Pamphlets distributed—			
(1) By the Public Health Service—			
(a) In response to requests from—			
(1a) Individuals.....	422,961	108,332	49,238
(2a) Public officials and organizations.....	2,666,070	403,126	122,227
(3a) Industries.....	224,793	100,667	7,967
(b) Directly to—			
(1a) The public (official mailing lists and general circularizations).....	2 2,183,655	3 982,334	4 120,641
(2a) State boards of health.....	831,029	667,534	34,241
(3a) States in draft campaign.....	3,143,700	.....	.....
(4a) Public Health Service field officers.....	242,658	52,687	7,769
(5a) Other field agencies.....	405,906	.....	.....
Total.....	10,120,772	2,314,680	342,083
(2) In the field by—			
(a) State boards of health.....	5,817,042	6,488,333	3,818,670
(b) States in draft campaign.....	2,286,912	.....	.....
(c) Clinics.....	131,009	.....	.....
Total.....	8,234,963	6,488,333	3,818,670
(3) Gross total pamphlets distributed.....	18,355,735	8,803,013	4,160,753
Minus pamphlets distributed by the Public Health Service to—			
(a) State boards of health.....	831,029	667,534	34,241
(b) States in draft campaign.....	3,143,700	.....	.....
(c) Public Health Service field officers.....	242,658	52,687	7,769
Total subtracted.....	4,217,387	720,221	42,010
(4) Net total pamphlets distributed.....	14,138,348	8,082,792	4,118,743

¹ The total (353,054) reported in 1919 was an error. ² Includes 653,720 pieces of the industrial program.

³ Includes 403,168 pieces of the industrial program. ⁴ Includes 90,384 pieces of the industrial program.

Statistical summary of activities in the control of venereal diseases, comparative table showing the fiscal years 1919, 1920, and 1921—Continued.

	1919	1920	1921
<i>Educational activities—Continued.</i>			
I. Pamphlets—Continued.			
C. Framed placards posted.....	64,892		
D. Pamphlets purchased and reprinted by State boards of health.....	10,510,524	5,816,830	4,081,697
E. Pieces of the industrial program purchased.....	668,668	186,588	84,763
F. Different educational venereal disease pamphlets issued by the Public Health Service.....	50	5	7
G. Revisions of venereal disease pamphlets issued by the Public Health Service.....		4	4
II. Lectures and addresses:			
A. Lectures and addresses reported.....	1 428 2 7,210 3 654	1 563 2 11,797	1 607 2 8,384
Average attendance.....	1 220 2 181 3 444	1 206 2 131	1 217 2 130
B. Meetings under A at which films or exhibits were shown.....	1 74 2 627	1 92 2 429	1 13 2 2,258
C. Meetings under A at which resolutions were adopted.....	1 70	1 71	
D. State board of health meetings under A included in Public Health Service report, deducted from total.....	83		
E. Total lectures and addresses reported.....	8,209	12,360	8,991
Average attendance.....	201	134	136
III. Conferences reported by the Public Health Service.....	16	25	16
Average attendance.....	184	188	243
Conferences at which resolutions were adopted.....	16	22	
IV. Exhibits and lantern slides:			
A. Exhibits and slides loaned by the Public Health Service to—			
(1) State boards of health.....	441	45	
(2) Public Health Service officers.....	10		
(3) Y. M. C. A.'s.....	59	13	
(4) Others.....	41	72	
Total.....	551	130	
B. Exhibits and slides purchased by—			
(1) State boards of health.....	125	653	5 658
(2) Y. M. C. A.'s.....	78	10	243
(3) Others.....	18	13	155
Total.....	221	676	5 1,056
C. Exhibit and lantern slide showings reported.....	1 888 2 11,716 3 1,302	1 26 2 11,007 3 1,649	1 25 2 4,417 3 1,353
Average attendance.....	2 223	2 206	2 259
D. State board of health showings under C included in Public Health Service report, deducted from total.....	418		
E. Total showings reported.....	2,186	11,033	4,442
Average attendance.....	255	207	230
V. Motion-picture films:			
A. Motion-picture films loaned by the Public Health Service to—			
(1) State boards of health.....	21	1	
(2) Others.....	384	3	
Total.....	405	4	
B. Motion-picture films purchased by State boards of health.....	65	55	6 136
C. Motion-picture showings reported.....	1 275 2 1,134 3 1,522	1 241 2 1,916 3 1,338	1 72 2 1,612 3 1,374
Average attendance.....	2 555	2 313	2 256
D. State board of health showings under C included in Public Health Service report, deducted from total.....	11		

1 Public Health Service.

2 State boards of health.

3 Clinics.

4 Reports incomplete.

5 Includes exhibits borrowed.

6 Includes films borrowed.

Statistical summary of activities in the control of venereal diseases, comparative table showing the fiscal years 1919, 1920, and 1921—Continued.

	1919	1919	1921
<i>Educational activities—Continued.</i>			
V. Motion-picture films—Continued.			
E. Total showings reported.....	1,398	2,157	1,684
Average attendance.....	549	320	261
VI. Publicity material:			
A. Articles furnished magazines.....	3,228	320	4,192
B. Periodicals containing articles received.....	157	118	176
C. Circulation of articles published.....	4,470,756	3,190,786	1,780,795
<i>Law-enforcement activities.</i>			
I. States qualifying for Chamberlain-Kahn funds.....	46	46	46
II. States enacting legislation for venereal disease control.....	40	¹ 13	39
III. City ordinances for venereal-disease control.....	222	102	28

¹ This does not include States making appropriations entitling them to Federal allotment.

GENERAL INSPECTION SERVICE.

Number of hospitals under contract with the United States Public Health Service, April 19, 1921.....	1,412
Number of contract hospitals having United States Public Health Service patients	766
Number of hospitals under contract not used.....	646

Inspections and investigations.

From July 1, 1920, to June 30, 1921 (inclusive) :	
Special investigations, general.....	773
Special investigations, congressional.....	103
Service hospital inspections.....	175
Contract hospital inspections.....	1,391
Property condemnations.....	25
Cases referred to the Department of Justice.....	151
From January 1, 1921, to June 30, 1921 (inclusive) :	
Special investigations, general.....	542
Special investigations, congressional.....	80
Service hospital inspections.....	140
Contract hospital inspections.....	912

The following table indicates the number of officers, stations visited, and mileage traveled for the nine months from September, 1920, to May 31, 1921. The figures for the months of July and August, 1920, are not available, because of the fact that the consolidated monthly reports from officers were not required prior to September, 1920.

Date.	Number of stations visited.	Mileage.	Date.	Number of stations visited.	Mileage.
1920.			1921—Continued.		
September.....	41	16,708	March.....	165	27,025
October.....	59	11,279	April.....	142	26,584
November.....	75	19,961	May.....	179	37,623
December.....	52	15,019	June.....	192	31,662
1921.			Total.....	1,117	237,656
January.....	88	28,121			
February.....	124	23,674			

A review of the time spent and the number of persons utilized leads to the conclusion that approximately one-third of the activities of the General Inspection Service have been taken up with matters of special investigations, one-third with the inspection of Service hospitals, and one-third with inspections of contract hospitals and District Supervisors' Offices. The mileage involved in the inspection of contract hospitals is approximately one-half of the total.

Average officers on duty.

Date.	Head- quarters.	Area offices.	Total.	Date.	Head- quarters.	Area offices.	Total.
1920				1921			
July.....	*2.5	8	10.5	January.....	*5	11.5	16.5
August.....	*2.5	7	9.5	February.....	*6	14	20
September.....	*2	7	9	March.....	*5.5	15	20.5
October.....	*3	7.5	10.5	April.....	*6.5	15	21.5
November.....	*4	10	14	May.....	*7	15	22
December.....	*4	10	14	June.....	*7	16	23

* Indicates months during which one officer was on detached duty, whole or part time.

Changes in personnel.

Officers on duty July 1, 1920.....	11
Officers gained during fiscal year.....	14
Officers lost during fiscal year.....	2
Net gain.....	12
Officers on duty June 30, 1921.....	23
Average officers on duty during fiscal year.....	15.5

Inspection areas.

July 1, 1920, areas organized (Nos. 1, 5, 6, 8).....	4
Areas organized during fiscal year (Nos. 2, 3, 4, 7, 9, 10, 11).....	7
Dates of organizations:	
Area No. 1.....	June 5, 1920.
Area No. 2.....	June 17, 1921.
Area No. 3.....	December 29, 1920.
Area No. 4.....	December 29, 1920.
Area No. 5.....	April 15, 1920.
Area No. 6.....	April 14, 1920.
Area No. 7.....	January 12, 1921.
Area No. 8.....	June 17, 1920.
Area No. 9.....	January 25, 1921.
Area No. 10.....	September 21, 1920.
Area No. 11.....	September 3, 1920.

SECTION OF PUBLIC HEALTH EDUCATION.

During the fiscal year ending June 30, 1921, 120 new publications were issued, compared with 53 during the preceding year. The total number of copies of these publications and of reprints of previous documents distributed aggregated 859,808, as compared with 5,806,220 copies during the preceding fiscal year and with 9,532,392 the year before that. The very high figures for the two preceding years are due largely to the widespread distribution of leaflets dealing with influenza. The 859,808 leaflets sent in response to 43,523 public requests does not include the publications printed and distributed by the Division of Venereal Diseases.

During the fiscal year 64 issues of mimeographed bulletins were prepared and issued by the Public Health Service to newspapers, publishing agencies, and individuals. These dealt largely with the results of studies and investigations made by the Public Health Service.

The section received 119 requests for stereopticon slides, and in response to these requests loaned 8,667 slides. The demand for these slides has been greater than it has been possible to meet. Many slides were not available when called for, owing to their use elsewhere. There were available no funds and have not been for several years, with which to make additions to the stereopticon library.

An extensive revision of the mailing lists was undertaken, with the result that the weekly edition of Public Health Reports was reduced by over 4,000 copies. Several of the lists previously maintained were entirely abolished, thus effecting a further saving on the routine distribution of publications of the service.

In its educational work the section has concentrated its work on the preparation and distribution of health articles for the use of newspapers, magazines, house organs, labor papers, and the like. In addition to this it has supplied a health column which is widely used by newspapers throughout the country. Sufficient material is supplied to permit daily publication of the health column.

An enormous number of letters are received from people in all parts of the United States who look to the United States Public Health Service for authoritative information on health subjects. All of these are given individual attention, and though form letters can, to some extent, be utilized, almost all of these requests for information demand the personal attention of the chief of section.

There is a constant demand on the part of newspapers and magazines for well-made photographs illustrating the bureau's activities. At the present time the section has available no funds for making such photographs and finds it difficult to meet these requests.

The section has been called on and has supplied technical advice and information on various phases of health education to State and city health officers and others engaged or interested in public health.

The section has received many requests for the loan of exhibit material, posters, and motion pictures, but compliance with most of these has been impossible because of the lack of funds.

PURVEYING SERVICE.

The following table shows the transactions of the Purveying Service, including the supply depots at Perryville, Md., and North Chicago, Ill., during the fiscal year ending June 30, 1921. It will be noted from this table that Army supplies in the value of \$5,888,512.95 were turned over during the year for use of the service, of which supplies in the value of \$1,675,091.19 were reissued to stations of the service. The fact that such supplies were turned over by the Army eliminated the necessity of incurring large expenditures for the purchase of similar supplies, payable from the appropriations for the Public Health Service.

In addition to supplies thus received from the Army, supplies and equipment required for use at stations of the service were purchased whenever possible from surplus stock turned over by other departments to the General Supply Committee, in accordance with Executive order of December 6, 1918.

Expenditures for supplies and equipment purchased by the Purveying Service during the fiscal year 1921, classified by subject matter.

1. Drugs and chemicals.....	\$196,841.33
2. Surgical instruments and appliances.....	47,822.05
3. Hospital furniture and equipment.....	664,600.51
4. Furniture and equipment for quarters.....	269,891.56
5. Office furniture and supplies.....	263,132.47
6. Typewriters and adding machines.....	84,545.11
7. Hospital supplies.....	188,518.33
8. X-ray supplies and equipment.....	215,358.48
9. Laboratory supplies and equipment.....	89,765.39
10. Kitchen and dining room equipment.....	489,225.69
11. Bedding, clothing, and towelings.....	208,422.11
12. Hardware, plumbing supplies, and lumber.....	321,061.37
13. Books and journals.....	20,234.69
14. Dental supplies.....	203,567.15
15. Physio-therapy supplies.....	76,488.98
16. Occupational therapy supplies.....	64,221.01
17. Prosthetic and orthopedic supplies.....	99,495.43
18. Auto vehicles and accessories.....	285,220.63
19. Electrical supplies.....	141,089.59
20. Live stock.....	20,781.73
21. Miscellaneous hospital supplies and equipment.....	712,947.69
22. Miscellaneous.....	302,922.07
Total.....	4,966,153.37

Operating expenses of the Purveying Service during the fiscal year 1921.

OFFICE EXPENSES.

WASHINGTON, D. C.

Salaries of all employees.....	\$170,374.04
Office equipment, furniture, and supplies.....	13,496.97
Lumber and packing material.....	1,781.78
Telephone service.....	810.05
Traveling expenses.....	669.74
Ice.....	574.60
Advertising.....	415.55
Hardware.....	194.42
Laundry.....	55.88
Miscellaneous.....	1,708.02
	<hr/> \$190,081.05

PURVEYING SERVICE GARAGE AND REPAIR SHOP—WASHINGTON, D. C.

Salaries of all employees.....	\$4,866.49	
Gasoline and oils.....	7,527.84	
Spare parts, etc.....	3,081.00	
		\$15,475.23

SUPPLY DEPOT—PERRYVILLE, MD.

Pay, allowance, and commutation:		
Pharmacist in charge.....	\$3,579.51	
Clerk, stenographers, etc.....	58,057.50	
Laborers ¹	233,847.05	
		\$295,484.06
Freight, express, and travel expenses:		
Freight.....	110,442.39	
Express.....	5,033.60	
Travel expenses.....	3,185.22	
Demurrage.....	243.00	
		118,904.21
Maintenance:		
Gasoline, oils, etc.....	17,054.37	
Automobile repair parts.....	13,269.74	
Tools and equipment.....	58.38	
Packing materials.....	322.20	
Gas for welding purposes.....	468.33	
Bridge toll.....	794.45	
Telephone service.....	314.50	
Miscellaneous.....	1,542.84	
		33,824.81

SUPPLY DEPOT—NORTH CHICAGO, ILL.

Pay, allowances, and commutation:		
Administrative assistant in charge.....	\$1,008.72	
Clerks, stenographers, etc.....	10,166.15	
Mechanics, skilled laborers, laborers, etc (per diem or hourly basis).....	21,640.97	
		\$32,815.84
Freight, express, and travel expenses:		
Freight.....	55,921.84	
Express.....	1,385.40	
Travel expenses.....	137.61	
Demurrage.....	22.00	
		57,466.85
Maintenance:		
Gasoline, oils, etc.....	1,578.13	
Automobile repair parts.....	1,448.18	
Tools and equipment.....	8,467.34	
Gas for welding purposes.....	36.37	
Telephone service.....	127.95	
Coal.....	3,942.51	
Installing motor and machinery.....	645.85	
Electric current.....	871.02	
Repairing furniture.....	718.78	
Erecting shelving in open stock department.....	2,160.00	
Putting heating plant in operation.....	80.00	
Plumbing.....	225.00	
Water.....	.48	
Painting building.....	5,110.00	
Automobile plant.....	1,025.00	
Erecting partitions in machine shop.....	2,586.50	

¹ Per diem or hourly basis.

Maintenance—Continued.

Painting smokestacks.....	\$175. 00
Erecting crane supports.....	679. 47
Miscellaneous.....	39. 92
	<u>\$29, 917. 50</u>
Grand total operating expenses.....	773, 969. 55

Quantity of supplies handled.

	Unit.	Per annum.	Average per hour each day.
SUPPLY DEPOT—PERRYVILLE, MD.			
Total number shipments received.....	Each.....	3, 423	1. 42
Total number packages received.....	.....do.....	122, 806	51. 25
Total weight supplies received.....	Pound.....	17, 890, 114	7, 466. 65
Total number shipments made.....	Each.....	17, 783	7. 42
Total number packages shipped.....	.....do.....	72, 408	30. 22
Total weight supplies shipped.....	Pound.....	10, 330, 943	4, 311. 70
SUPPLY DEPOT—NORTH CHICAGO, ILL.			
Total number shipments received.....	Each.....	667	. 278
Total number packages received.....	.....do.....	37, 968	15. 84
Total weight supplies received.....	Pound.....	6, 796, 378	2, 836. 55
Total number shipments made.....	Each.....	612	. 255
Total number packages shipped.....	.....do.....	6, 670	2. 78
Total weight supplies shipped.....	Pound.....	917, 658	382. 99

(The above computed on a basis of 2,396 working hours during the year.)

Summary of transactions of the Purveying Service during the fiscal year 1921.

Operating expenses of main office, Washington, D. C.....	\$205, 556. 38
Operating expenses of supply depot, Perryville, Md.....	448, 213. 08
Operating expenses of supply depot, North Chicago, Ill.....	120, 200. 19

Total cost of operating Purveying Service..... 773, 969. 65

Cost of maintenance of Purveying Service garage and repair shop, Washington, D. C.....	15, 475. 23
Cost of maintenance of motor repair and salvage shops, Perryville, Md.....	155, 181. 74
Cost of maintenance of motor repair and salvage shops, North Chicago, Ill.....	24, 359. 35

Total..... ² 195, 016. 32

Total value of supplies received in stock (purchase orders).....	1, 914, 039. 61
Total value of supplies received in stock (Army supplies).....	5, 888, 512. 95

Total value of supplies received in stock.....	7, 802, 552. 56
Total value of supplies furnished fiscal year 1921.....	8, 590, 473. 15
Total operating expenses of the Purveying Service.....	773, 969. 65
Total operating expenses of motor transportation repair and salvage shops.....	195, 016. 32
Total operating expenses exclusive of maintenance of motor transportation repair and salvage shops.....	583, 819. 82
Percentage cost of operating Purveying Service, including the cost of maintenance of motor transportation repair and salvage shops.....	9. 0
Percentage cost of operating Purveying Service, exclusive of maintenance of motor transportation repair and salvage shops.....	6. 7

² The cost of maintenance of the Purveying Service garage and repair shop, Washington, D. C., and the motor and salvage shops at Perryville, Md., and North Chicago, Ill., is included above in the total operating expenses of the Purveying Service.

CHIEF CLERK'S OFFICE.

BUREAU OFFICE QUARTERS AND STORAGE SPACE.

Shortly after the beginning of the fiscal year the bureau was assigned two wings of Building C, a temporary structure at Seventh and B Streets SW., and immediately moved thereto all of its activities from other parts of the city, except those which could be accommodated in the Butler Building, a permanent structure at New Jersey Avenue and B Street, SE., which had been the home of the bureau for many years. However, it was soon found that even these two large wings in C Building were insufficient, and accordingly additional space was secured in Building F, in the immediate vicinity. In the latter part of the fiscal year the Public Buildings Commission allowed the bureau a portion of a third wing of Building C, and this is now occupied.

The present quarters are reasonably satisfactory, except for the fire hazard, which is so serious that it is hoped the time is not far distant when space in a building of permanent construction may be available. The amount of Government property now in these quarters is very considerable, but the most serious source of concern is the possibility of destruction of official papers and records which could not be replaced.

Material assistance has been received and a considerable saving in expenditure effected through the valuable cooperation extended to this bureau by the staff and working force of the Office of the Superintendent of the State, War, and Navy Department Buildings, which has charge of Buildings C and F, as well as other buildings in the vicinity. The care of these two buildings and the service rendered to the occupants has been in every respect satisfactory.

PERSONNEL OF BUREAU.

On June 30, 1920, the personnel on duty in the bureau numbered 529. The continued expansion of the field activities of the service made it necessary to steadily increase this force until April, 1921, when the total force on duty was 784 clerical employees and 48 medical officers.

On April 19, 1921, an order was issued by the Secretary of the Treasury directing the transfer of certain functions connected with the hospital service to the Bureau of War Risk Insurance, together with the personnel and equipment affected. Accordingly, 65 employees in the bureau at Washington were transferred, and at the same time a careful survey was made of the bureau in an effort to further decrease the force. As a result, 81 additional positions were abolished by June 30, making a total reduction of 146 employees. There was also a reduction of 9 medical officers, and the total personnel on duty July 1, 1921, therefore, numbered 677. Still further reductions have been made since the close of the fiscal year.

These decreases in force were made possible partly by some reduction in work, but more largely by increased efficiency of the force, due to accumulated experience and training and the gradual elimination of the less competent employees. In selecting the employees to be released, comparative efficiency was the principal determining factor.

PUBLIC HEALTH LIBRARY.

Number of books acquired by purchase.....	38
Number of books acquired by exchanges, gifts, etc.....	375
Total number of books in library.....	8, 440
Total number of pamphlets.....	3, 000

The facilities of the library have been improved by additional equipment. The new steel shelving which has been installed accommodates approximately one-half the collection.

An accumulation of old material has been sorted and many publications of value have thus been obtained. From this source it has been possible to complete various files of important documents, especially the reports and other publications of the departments of health of foreign governments. Such files when completed have been bound for permanent preservation.

The work of classifying and cataloguing has proceeded steadily. Serial publications to the number of 350 are regularly received and circulated. Of this number 90 are periodicals, of which 44 are paid subscriptions and 46 are received gratuitously or by exchange.

An important service of the library is to gather data from works in this and other libraries for the use of bureau divisions and technical officers engaged in research and publication work.

STATIONERY AND PRINTING SUPPLIES.

For many years this bureau and all its activities in the field had been furnished with stationery supplies, blank forms, and other printing by the Division of Printing and Stationery of the Treasury Department upon requisitions passed upon and approved by the chief clerk of the bureau. However, with the very great expansion of the hospitals and medical relief activities for the treatment of ex-service men, it developed that the facilities of that division were entirely inadequate to furnish these supplies with the necessary promptness. The delays were so serious that complaints from hospitals and other stations were continuous and it was evident that medical relief work was being handicapped. An effort to improve matters was made by loaning to the Division of Printing and Stationery a number of clerical and subclerical employees and by otherwise closely cooperating with that division, but the results were not satisfactory. Finally at the suggestion of the Chief of the Division of Printing and Stationery and with the approval of the Secretary of the Treasury, arrangements were made for the establishment of separate storage and shipping facilities for the Public Health Service. For this purpose, the Public Buildings Commission granted approximately 20,000 feet of space in F Building, which is on Seventh Street in the immediate vicinity of the bureau proper and therefore convenient for administrative purposes. This space was at once equipped for storage and shipping purposes by rein-

forcing the floors and erecting shelving at a cost of \$3,294, and an initial stock of stationery and blank forms placed therein of a value of approximately \$250,000. Shipping operations were begun in May, 1921, and the results have been so satisfactory that since that date almost no complaints have been received from the field stations concerning delays in furnishing these essential supplies. The average time required to fill a requisition varies from 24 to 48 hours, and the adequate space and accommodations have made possible many economies in operation.

The stock of stationery and blank forms and record books is stored and recorded in such a manner that it is easily practicable to keep the stock up to the necessary level and yet to avoid wasteful accumulations.

The entire process of ordering, storing, recording, and dispensing these supplies is now under the chief clerk of the bureau. Simple, but complete, records are kept with the following objects in view:

1. That the office may know at a glance the quantities furnished any station in the past.
2. That the office may judge, by comparison, whether requisitions are probably extravagant.
3. That there be no delay in passing upon and filling requisitions.
4. That there be no unreasonable delay by contractors or the Government Printing Office in completing delivery of orders.
5. That the office may know at any time the amount expended for any and all items of these supplies.
6. That the office may know at all times, by items, the quantities of blank forms and stationery on hand available for distribution.

No records are kept except those that serve a necessary or practical purpose.

The total expenditures for stationery supplies during the year aggregated \$535,045.58, and that for printing publications and blank forms and records, \$233,538.98.

At the close of the year the cost per month of operating this unit was as follows:

Salaries of clerical employees.....	\$1,142
Salaries of labor force.....	530
Material for wrapping and packing.....	200
Total monthly operating expense.....	1,872

SUPPLIES AND EQUIPMENT FOR THE BUREAU.

The rapid growth of the bureau made necessary a prompt and efficient supply service, particularly in office equipment and devices and telephone service. The purchase and supply clerk's office made an excellent record in this respect, and in addition perfected a system of property records which is proving of great practical value. The transactions of this office, in summary, were as follows:

Requisitions and orders.

Orders placed for supplies.....	2,508
Office requisitions for supplies.....	6,237
Office requisitions for repairs and services.....	1,152

Classified by subject matter.

1. Furniture supplies-----	\$39,513.69
2. Photostatic supplies-----	30,879.10
3. Filing equipment-----	25,111.86
4. Typewriters, adding machines, duplicating equipment, other labor-saving devices, and repairs to same-----	19,825.87
5. Rubber stamps-----	659.07
6. Repairs and improvements to office quarters-----	12,310.29
7. Miscellaneous-----	8,868.99
8. Tabulating equipment-----	1,448.00
9. Electric fans-----	4,263.73
10. Purchase of clocks and repairs to clocks-----	1,362.32
11. Laundry-----	463.19
12. Ice-----	1,156.14
13. Telephone equipment and service-----	5,280.78
14. Telegraph service-----	21,314.37
Total-----	172,457.40

IMPROVEMENTS AND ADDITIONAL FACILITIES IN THE BUREAU.

Time-keeping system.—Early in the fiscal year there was installed a modern time-keeping system, consisting of a numbered card for each employee upon which the employee registers the time of arrival and departure or absence during the day. These cards are kept in numbered racks under the immediate observation of the time clerk, and the system operates with a minimum of labor and with almost no possibility of errors.

Information service.—The time clerk's room in C Building serves also as an information room and is equipped with data that greatly facilitates the answering of questions from callers on official business. This facility saves a considerable amount of time which would otherwise be expended by clerks and officials in unnecessary interviews with callers. The service is also a great help to the public in doing business with the bureau. A similar convenience will shortly be installed in the Butler Building, utilizing the existing force, which will also result in saving the salary of a watchman.

Motor transportation.—A simple but efficient system has been evolved for the control of the movement of passenger cars and trucks, whereby the clerk in charge knows at all hours of the day where each car is, and when it should return to the bureau. The dispatch slips turned in by the drivers are placed in a simple file and provide a permanent record of operations, which has been found invaluable for reference purposes. All cars receive daily inspection, and records are kept of the work of each chauffeur in respect to mileage, gas consumption, and care of his car. This method has resulted in steadily growing efficiency.

Mail and messenger service.—During the year all mail and messenger service throughout the bureau was consolidated under the chief clerk, and by persevering efforts on the part of the employees concerned, the operations involved have been systematized and simplified so that the system is now working with comparative smoothness. Through these improvements not only has it been possible to reduce the messenger and mail room force, but papers move with much greater speed and accuracy than formerly, and the general operations of the bureau have been facilitated and economy promoted.

Duplicating unit.—A similar consolidation of all duplicating work in the bureau was effected, with a resulting great increase in capacity of the unit and improvement in the quality of work. The multi-graph work in particular has been of such excellent and wide variety as to save the bureau thousands of dollars in the avoidance of expensive printing. Carefully kept records show conclusively that the multigraph machine can do simple jobs not only in one-tenth of the time required by the printing office, but at far less expense. Likewise much clerical labor was saved by the use of the addressograph machine used in connection with the distribution of circulars and orders to the field service. Some of the equipment used in connection with this work was obtained by transfer without expense, and other portions from surplus stock in the hands of the General Supply Committee. The following statistics for the last half of the fiscal year are of interest in this connection:

Cost of operating duplicating unit from January 1 to June 30, 1921.

Materials, salaries, and depreciation	\$14, 435. 58
Estimated commercial cost of the same work	28, 094. 22
Estimated net saving	13, 658. 64
Number of copies of mimeograph work	1, 378, 703
Number of copies of multigraph work	4, 239, 270
Average number of copies per job	7. 375

Carpenter shop.—The services of a carpenter were obtained during the year and a small but thoroughly equipped shop was installed at a cost of \$325. The carpenter has no assistant, but through obtaining modern labor-saving machines his capacity was almost doubled. His services have become invaluable in the devising of improvements in equipment and working facilities, and in addition thereto, he has repaired a considerable amount of damaged office furniture, installed shelving, etc. Much of the material used by him was salvaged from broken cabinets and discarded shelving. Without his services this material would have been a virtual loss. The following figures in this connection are of interest:

Value of products of carpenter ship (estimated upon comparative costs of contractor's work)	\$1, 540. 32
Estimated additional saving through avoidance of clerical work involved in the obtaining of proposals, auditing vouchers in payment, etc	485. 00
Estimated total	2, 025. 32
Salary of carpenter	\$737. 00
Cost of material used	279. 31
Cost of work done by carpenter	1, 016. 31
Saving to the bureau	1, 009. 01

Emergency rest room.—This room was fitted up with but little cost to the bureau and was supervised by a matron, as an incident to her other duties. The room was used a total of 940 times and the records kept show that its facilities were not abused and that very probably it saved considerable sick leave.

Telephone system.—Two switchboards were in operation, and the operators were provided with card indexes and other data, so that

they might become efficient information clerks for the purpose of routing calls and guiding those who sought information by telephone. The results have been very satisfactory.

Consolidated supply room.—A single supply room was established under the chief clerk, eliminating all other supply rooms, except one small one under the Venereal Disease Division. This consolidation saved labor and gave better control over supplies, and the supply room serves not only the bureau but also the dispensary, the purveying service, and other offices.

FUTURE IMPROVEMENTS.

Plans are under way to establish a system of efficiency ratings which will not only offer a basis for a systematic method of promotions, but will also be helpful in assigning and transferring clerks to the work for which they are best suited.

An outgoing mail unit for the entire bureau is in immediate contemplation. This unit would work in conjunction with the mail room and the general files room and it is believed would not only expedite the business of the bureau but would result in the saving of a very considerable amount of clerical work in the various divisions of the bureau.

Careful and exhaustive studies are in progress with a view to the adoption of a general system of files for the use of the entire bureau, and also the field service. It is expected that this improvement will result not only in material saving in clerical force, but in other great advantages in the prompt and orderly transaction of official business as well as in the avoidance of errors.

Plans have been approved and partly executed for the installation of a multiple telephone switchboard to take the place of the two switchboards previously in operation in the Butler Building and C Building. This is being accomplished at very small cost and will result not only in great improvement in the service but in eliminating the services of one telephone operator.

NEEDS OF THE SERVICE.

NATIONAL AND INTERSTATE QUARANTINE.

The Federal quarantine facilities will require some improvement and extension in order to increase the protection now afforded the United States. Some of the stations require changes and repairs and some new stations should be established in order to make more effective the application of United States laws relating to quarantine and immigration. For example, there should be established an efficient patrol on the Mexican border to prevent the introduction into the United States of typhus fever, and a quarantine detention station at the Lake Sabine ports in order to prevent the introduction of plague.

For the prevention of the interstate spread of other diseases, the Congress has appropriated \$25,000. This sum, of course, is wholly inadequate, but in order to utilize it to the greatest advantage it is expended for the most part in cooperation with State and local health agencies in the matter of the enforcement of regulations governing water supplies furnished to the public by interstate carriers. By this method it has been possible to control and make safe for travelers about 45 per cent of the water supplies used in interstate traffic. Sufficient funds should be provided so that within a reasonable period, for example, five years, 100 per cent of such supplies would be brought under control.

For the prevention of venereal diseases, the Congress has made a special appropriation. These funds are used by the Public Health Service in cooperation with State boards of health. This cooperative work has been so effectual and has brought all health authorities to such a realization of the necessity for work of this character, that it is recommended that it be continued and that funds for allotment to State boards of health for this purpose be continued to be provided by the Congress.

SCIENTIFIC RESEARCH.

The funds appropriated for scientific research have not been sufficient to meet the needs of the investigations in this field, and it is recommended that they be increased in so far as the revenues of the country will permit, in order that the Public Health Service may institute intensive investigations of diseases like pneumonia, which causes one-tenth of all the deaths, tuberculosis, which causes approximately 150,000 deaths annually, and infant mortality, which accounts for the deaths of over 200,000 infants annually.

As a basis for such research work it is obvious that the Public Health Service should secure better reporting of the preventable diseases as they occur in the United States. For this purpose a small appropriation should be added to the funds appropriated for the investigation of diseases, and a beginning made for the establishment of a registration area for morbidity reports.

In order that the results of the studies and investigations made by the Public Health Service may be published for the information of the public, consideration should be given to the publication of its reports in numbers sufficient for this purpose.

NATIONAL HEALTH PROGRAM.

To meet urgent national needs by outlining health activities which are practicable and which would yield the maximum results in protecting the national health and diminish the annual toll of thousands of lives taken by preventable diseases and insanitary conditions, the Public Health Service prepared some years ago a national health program. It is realized that such a program should be made operative at the earliest practicable moment, depending, of course, upon the Federal, State, and local revenues available for this purpose. This is a comprehensive program and should be used as a guide to all Federal health activities appropriated for by the Congress, and such appropriations as may be made should be used in those investigations which may be expected to yield the best results in health promotion and life saving.

Personnel.

Since it may be expected that the Public Health Service will continue to furnish medical, surgical, and hospital services to beneficiaries of the Veterans' Bureau, in accordance with the Sweet Act, it will become necessary to make some permanent provision for a certain proportion of the medical and dental officers, nurses, dietitians, and reconstruction aides, many of whom are now serving under temporary employment. The uncertainty of the tenure of office of these groups of personnel tends to create an unrest among them and detracts from the efficiency of their services. Furthermore, the uncertainty has attracted to these groups quite a number of "floaters" who are not of the highest type of their profession. Every effort is now being made to weed out the inefficient, but in order to obtain and retain in the service professional men and women who are up to the highest professional standards, some legislation should be enacted to provide for permanent tenure of office so that the Government could offer a life career to these professional groups.

At the present time the Public Health Service is utilizing the Reserve Corps of medical and dental surgeons authorized by the Congress to meet emergency conditions. The nurses, dietitians, and reconstruction aides are serving under regulations authorized by the President. I would, therefore, recommend that the Congress enact a law authorizing the transfer of a sufficient number of the Reserve Corps to the regular commissioned corps of the Public Health Service to meet the hospital needs of the service, which are of a permanent nature, and that there be included in the legislation authority for the creation of a corps of nurses, dietitians, and reconstruction aides.

H. S. CUMMING,
Surgeon General.

To the honorable A. W. MELLON,
Secretary of the Treasury.

APPENDIX.

FINANCIAL STATEMENT.

Receipts and expenditures, Public Health Service, for the fiscal year ended June 30, 1921.

APPROPRIATION: "PUBLIC HEALTH SERVICE, 1921."

Subheads of appropriations.	Appropriations and repayments.	Expenditures.	Balance, June 30, 1921.
Pay, etc., commissioned officers and pharmacists (appropriation, \$995,080)	\$996,293.59	\$962,195.77	\$34,097.82
Pay of acting assistant surgeons (appropriations, \$343,200) ..	353,391.05	333,387.64	20,003.41
Pay of other employees (appropriation, \$740,000)	925,063.88	847,059.02	78,004.86
Freight, transportation, etc. (appropriations, \$57,000)	58,037.47	50,039.34	7,998.13
Fuel, light, and water (appropriation, \$135,000)	135,006.06	133,982.39	1,023.67
Furniture, etc.	8,000.00	7,066.98	933.02
Purveying depot supplies (appropriation, \$85,000)	115,115.69	114,821.04	294.65
Maintenance, Hygienic Laboratory	45,000.00	41,224.40	3,775.60
Maintenance, marine hospitals (appropriation, \$625,000) ..	1,202,116.03	1,180,000.00	22,116.03
Care of seamen, etc. (appropriation, \$220,000)	226,514.16	223,019.74	3,494.42
Books (appropriation, \$500)	503.00	499.12	3.88
Disbursements		3,248,999.46	.....
Encumbrances		644,295.98	.....
Total (appropriation, \$3,437,780)	4,065,040.93	3,893,295.44	171,745.49

APPROPRIATION: "QUARANTINE SERVICE, 1921."

Amount of appropriation	\$255,000.00
Repayments	247,276.52
Total	502,276.52
Expenditures:	
Disbursements	\$395,041.05
Encumbrances	105,071.08
	500,112.13
Balance June 30, 1921	2,164.39

Expenditures by stations.

Name of station.	Pay and allowances officers and employees. ¹	Maintenance.	Total maintenance, pay, and allowances.
Baltimore, Md.	\$24,784.35	\$23,571.44	\$48,355.79
Beaufort, S. C.	1,120.34	283.40	1,403.74
Biscayne Bay, Fla.	1,259.87	687.50	1,947.37
Boca Grande, Fla.	2,134.79	185.93	2,320.72
Boston, Mass.	60,340.56	85,740.76	146,081.32
Brownsville, Tex.	2,622.54	806.55	3,429.09
Brunswick, Ga.	6,367.14	5,923.02	12,290.16
Cape Charles, Va.	81,936.90	31,216.84	113,153.74
Cape Fear, N. C.	8,245.30	4,861.36	13,106.66
Cedar Keys, Fla.	265.00	.....	265.00
Cha teston, S. C.	15,784.78	6,775.18	22,559.96
Columbia River, Oreg.	9,034.70	5,341.97	14,376.67

¹ Paid from pay items appropriation "Public Health Service, 1921."

Expenditures by station—Continued.

Name of station.	Pay and allowances officers and employees.	Maintenance.	Total maintenance, pay, and allowances.
Cumberland Sound, Fla.	\$3, 106.03	\$234.45	\$3, 340.48
Delaware Bay and River.	2, 612.12	4, 306.12	6, 918.24
Delaware Breakwater, Del.	1, 876.97	152.17	2, 029.14
Eagle Pass, Tex.	14, 750.00	1, 274.47	16, 024.47
El Paso, Tex.	30, 499.91	4, 355.39	34, 855.30
Eureka, Calif.	125.00	5.00	130.00
Galveston, Tex.	29, 425.14	22, 160.34	51, 585.48
Georgetown, S. C.	318.45	1.50	319.95
Gulf, Miss.	6, 360.00	5, 737.51	12, 097.51
Honolulu, Hawaii.	32, 814.38	8, 157.60	40, 971.98
Hilo, Hawaii.	620.00	650.00	1, 270.00
Kalului, Hawaii.	100.00	30.00	130.00
Key West, Fla.	7, 646.96	1, 421.15	9, 068.11
Laredo, Tex.	7, 221.61	4, 090.50	11, 312.11
Leprosy Investigation Station.	7, 552.04	1, 778.65	9, 330.69
Leprosy Hospital, Hawaii.		93.72	93.72
Marcus Hook, Pa.	37, 727.11	16, 121.59	53, 848.70
Miscellaneous.	8, 252.52	12, 399.04	20, 651.56
Mobile, Ala.	14, 951.81	6, 343.63	21, 295.44
New Orleans, La.	53, 026.01	16, 536.95	69, 562.96
Pascagoula, Miss.	792.50	80.40	872.90
Pensacola, Fla.	10, 177.10	9, 023.62	19, 200.72
Eastport, Me.	1, 011.49		1, 011.49
Perth Amboy, N. J.	2, 412.59	1, 560.00	3, 972.59
Port Arthur, Tex.	3, 219.80	9, 295.12	12, 514.92
Port Aransas, Tex.	800.00	5, 076.89	5, 876.89
Port San Luis.	540.00		540.00
Portland, Me.	5, 226.05	2, 406.70	7, 632.75
Port Angeles, Wash.	207.50	6.00	213.50
Port Townsend, Wash.	20, 324.20	4, 737.95	25, 062.15
Providence, R. I.	11, 809.14	2, 230.05	14, 039.19
Ponce—Porto Rico.	7, 024.83	304.50	7, 329.33
Rosebank, N. Y.	218, 854.63	40.64	218, 895.27
Reedy Island, Del.	6, 580.23	6, 694.76	13, 274.99
San Juan, P. R.	28, 170.08	12, 481.71	40, 651.79
Sabine, Tex.	5, 233.88	9, 038.70	17, 272.58
San Diego, Calif.	11, 831.35	6, 166.44	17, 997.79
San Francisco, Calif.	46, 286.49	30, 209.87	76, 496.36
San Pedro, Calif.	2, 785.84	2, 267.78	6, 053.62
St. Andrews, Fla.	418.50	395.26	813.76
St. Georges Sound, Fla.	275.00	118.00	393.00
St. Josephs, Fla.	130.00	32.50	162.50
St. Johns River, Fla.	2, 970.52	2, 446.00	5, 416.52
St. Thomas, Virgin Islands.	14, 977.16	3, 189.27	18, 166.43
Savannah, Ga.	13, 341.56	10, 359.09	23, 700.65
Tampa Bay, Fla.	8, 929.32	4, 080.76	13, 010.08
Philippine Islands, stations.	2, 704.60		2, 704.60
Total.	902, 916.69	394, 485.74	1, 297, 402.43

APPROPRIATION "PREVENTING THE SPREAD OF EPIDEMIC DISEASES, 1921."

Amount of appropriation	\$1, 114, 000.00
Repayments	22, 761.57
Total	1, 136, 761.57

Expenditures:

Disbursements	871, 920.64
Encumbrances	259, 522.61
	1, 131, 443.25

As follows—

Plague eradication measures—

Louisiana	193, 903.45
Texas	194, 479.23
Florida	38, 779.74
California	16, 346.82
Washington	2, 520.90
Miscellaneous	97, 730.35

Expenditures—Continued.

As follows—Continued.

Prevention of trachoma—

Kentucky	33,506.47
Tennessee	5,677.18
North Dakota	6,026.97

Typhus fever prevention, Texas border..... 19,411.35

Preventive measures—

Baltimore, Ogdensburg, and miscellaneous stations.....	43,509.61
Cuba, South America, Mexico.....	12,252.32
France	12,741.22
England, Belgium, Holland, Sweden.....	8,901.05
Greece	625.00
Alaska, China, Canada.....	6,764.11
Italy, Spain	4,715.87
Rosebank, N. Y.	216,542.29
Travel, Telegrams, etc.....	23,435.18
Miscellaneous Quarantine Station.....	39,867.94
Bureau, Hospitals, Districts.....	9,693.76
Field Investigation Stations.....	3,625.98

Total..... 991,056.79

APPROPRIATION: "FIELD INVESTIGATIONS OF PUBLIC HEALTH, 1921."

Amount of appropriation..... \$300,000.00

Expenditures:

Disbursements.....	\$246,008.74	
Encumbrances.....	49,768.74	
		295,777.48

Balance June 30, 1921..... 4,222.52

APPROPRIATION: "NATIONAL QUARANTINE AND SANITATION."

Balance June 30, 1921..... \$810.63

APPROPRIATION: "INTERSTATE QUARANTINE SERVICE, 1921."

Amount of appropriation..... \$25,000.00

Expenditures:

Disbursements.....	\$22,091.38	
Encumbrances.....	2,113.00	
		24,204.38

Balance June 30, 1921..... 795.62

APPROPRIATION: "SPECIAL STUDY OF PELLAGRA, PUBLIC HEALTH SERVICE, 1921."

Amount of appropriation..... \$16,250.00

Expenditures:

Disbursements.....	\$8,262.02	
Encumbrances.....	15.19	
		8,277.21

Balance June 30, 1921..... 7,972.79

APPROPRIATION: "STUDIES OF RURAL SANITATION, PUBLIC HEALTH SERVICE, 1921."

Amount of appropriation..... \$50,000.00

Expenditures:

Disbursements	\$28,551.46	
Encumbrances	20,686.86	
		49,238.32

Balance, June 30, 1921..... 761.68

APPROPRIATION: "CONTROL OF BIOLOGIC PRODUCTS, PUBLIC HEALTH SERVICE, 1921."

Amount of appropriation-----		\$50,000.00
Expenditures:		
Disbursements-----	\$43,533.29	
Encumbrances-----	2,603.31	
		<u>46,136.60</u>
Balance, June 30, 1921-----		3,863.40

APPROPRIATION: "SALARIES, OFFICE OF SURGEON GENERAL, PUBLIC HEALTH SERVICE, 1921."

Amount of appropriation-----		\$92,970.00
Expenditures-----		89,322.12
		<u>3,647.88</u>
Balance, June 30, 1921-----		3,647.88

APPROPRIATION: "NATIONAL HOME FOR LEPERS."

Balance July 1, 1920-----		\$247,055.48
Expenditures (including \$200,000 transferred to Supervising Architect)-----		241,436.30
		<u>5,619.18</u>
Balance, June 30, 1921-----		5,619.18

APPROPRIATION: "MEDICAL AND HOSPITAL SERVICES, PUBLIC HEALTH SERVICE, 1921."

Amount of appropriation-----		\$38,638,085.99
Repayments-----		1,030,354.84
		<u>39,668,440.83</u>
Expenditures:		
Disbursements-----	\$33,246,890.64	
Encumbrances-----	6,332,318.92	
		<u>39,579,209.56</u>
Balance, June 30, 1921-----		89,231.27

APPROPRIATION: "PAY OF PERSONNEL AND MAINTENANCE OF HOSPITALS, PUBLIC HEALTH SERVICE, 1921."

Amount of appropriation-----		\$4,000,000.00
Repayments-----		2,559,501.47
		<u>6,559,501.47</u>
Expenditures:		
Disbursements-----	\$5,426,136.96	
Encumbrances-----	1,108,231.09	
		<u>6,534,368.05</u>
Balance, June 30, 1921-----		25,133.42

APPROPRIATION: "EXPENSES, DIVISION OF VENEREAL DISEASES, PUBLIC HEALTH SERVICE, 1921."

Amount of appropriation-----		\$200,000.00
Expenditures:		
Disbursements-----	\$181,923.11	
Encumbrances-----	15,408.00	
		<u>197,331.11</u>
Balance, June 30, 1921-----		2,668.89

APPROPRIATION: "HOSPITAL CONSTRUCTION, PUBLIC HEALTH SERVICE."

Balance July 1, 1920-----		\$2,853,645.12
Expenditures-----		2,159,373.09
		<u>694,272.03</u>
Balance, June 30, 1921-----		694,272.03

APPROPRIATION: "HOSPITAL FURNITURE, PUBLIC HEALTH SERVICE."

Balance, July 1, 1920-----	\$191,027.25
Expenditures-----	75,539.79
Balance, June 30, 1921-----	115,487.46

APPROPRIATION: "INCREASE OF COMPENSATION, TREASURY DEPARTMENT, 1921."

Total payments, Public Health Service-----	\$3,003,638.92
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MISCELLANEOUS APPROPRIATIONS.

LEPROSY HOSPITAL, HAWAII.

Balance, June 30, 1921-----	\$16,956.35
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MARINE HOSPITALS.

Baltimore, Md. (act Mar. 28, 1918):	
Balance June 30, 1921-----	\$15,767.41
Boston, Mass. (act Mar. 28, 1918):	
Balance July 1, 1920-----	\$19,915.00
Expenditures-----	13,105.74
Balance June 30, 1921-----	6,809.26
New Orleans, La. (act Mar. 28, 1918):	
Balance July 1, 1920-----	\$5,533.31
Expenditures-----	4,573.24
Balance June 30, 1921-----	960.07
New York, N. Y. (act Mar. 28, 1918):	
Balance July 1, 1920-----	\$19,201.64
Expenditures-----	742.80
Balance June 30, 1921-----	18,458.84
San Francisco, Calif. (act Mar. 28, 1918):	
Balance July 1, 1920-----	\$7,180.77
Expenditures-----	6,288.75
Balance June 30, 1921-----	892.02
Savannah, Ga. (act Mar. 28, 1918):	
Balance June 30, 1921-----	5,932.14
(Balances June 30, 1921.)	
Cleveland, Ohio (act Mar. 4, 1909)-----	100.00
Cleveland, Ohio (act Mar. 4, 1907)-----	374.95
Cleveland, Ohio (act July 26, 1916)-----	1,000.00

QUARANTINE STATIONS.

Boston, Mass (act Oct. 6, 1917):	
Balance July 1, 1920-----	\$11,914.60
Expenditures-----	1,241.25
Balance June 30, 1921-----	10,673.35
Cape Charles (act Nov. 4, 1918):	
Balance June 30, 1921-----	75,963.98
Gulf (act June 12, 1917):	
Balance June 30, 1921-----	8,000.00
Key West (act June 12, 1917):	
Balance June 30, 1921-----	7,000.00
Reedy Island (act Nov. 4, 1918):	
Balance June 1, 1921-----	33,001.64
Savannah, Ga. (act Nov. 4, 1918)-----	26,000.00

(Balances June 30, 1921.)

Brunswick (act June 25, 1910)-----	1, 708. 87
Charleston (act Mar. 4, 1909)-----	634. 46
Columbia River (act June 25, 1910)-----	745. 47
Columbia River (act June 12, 1917)-----	350. 90
Columbia River (act July 1, 1916)-----	4, 201. 19
Delaware Breakwater (act Mar. 4, 1907)-----	857. 00
Gulf (act Mar. 4, 1907)-----	353. 35
Honolulu (act Sept. 8, 1916)-----	10, 000. 00
Honolulu (act Mar. 4, 1907)-----	390. 52
Mobile (act July 1, 1916)-----	10, 000. 00
New Orleans (act July 1, 1916)-----	11, 150. 90
Pensacola (act Mar. 4, 1917)-----	18. 02
Reedy Island (act Mar. 4, 1909)-----	66. 71
San Francisco (act Mar. 27, 1908)-----	1, 511. 71
San Francisco (act June 30, 1906)-----	180. 75
Savannah (act Mar. 4, 1909)-----	410. 85

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